# THE CLIMATOLOGIST.

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## A MONTHLY JOURNAL OF MEDICINE,

DEVOTED TO THE

**Relation of Climate, Mineral Springs, Diet, Preventive Medicine, Race, Occupation, Life Insurance, and Sanitary Science to Disease.**



EDITED BY

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VOL. I.

W. B. SAUNDERS, PUBLISHER,
913 WALNUT STREET,
Philadelphia, Pa.

Collins Printing House,
705 Jayne Street.

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VOL. I. AUGUST, 1891. No. 1.

## INTRODUCTION.

THE object of this JOURNAL is to promote original investigation, to publish papers containing the observations and experience of physicians in this country and Europe on all matters relating to CLIMATOLOGY, MINERAL SPRINGS, DIET, PREVENTIVE MEDICINE, RACE, OCCUPATION, LIFE INSURANCE, AND SANITARY SCIENCE.

Thus we hope to supply the means by which the general practitioner and the public at large will become better acquainted with the diseases of this country and of Europe, and better armed to meet the requirements for their prevention or cure. The study of these subjects in this country is exciting great and increasing interest, and all admit that, from the little knowledge already possessed of its resources, possibly every known combination of atmospheric condition, soil, altitude, climate, or mineral springs is to be found on this continent. It is confidently expected that *a journal devoted to the study of all diseases into which climate, soil, race, occupation, hereditation, diet, contagion, etc.*

*enter prominently as factors,* will receive the encouragement of all, and become eventually an authority upon all subjects which are included in its title, although a thorough review of all progress in the departments mentioned will not be neglected. Especial attention will be given to the publication of *original material,* and it is to be hoped that physicians of all sections of the country will send papers upon any subjects which will be of general interest—such as the diseases of their locality—those incident to occupation, race, or climate, the study of epidemics, the questions of proper food, of the water supply, its potability and distribution, and all matters relating to drainage and diseases dependent on it.

Original papers based upon experimental studies, or laboratory investigations in bacteriology, will form a prominent portion of the material presented during the year.

Special attention will also be paid to the subject of health resorts, descriptions of Sanitariums with special reference to their suitability to certain cases, and the proper selection of patients for each variety of climate. The utmost care will be taken that this JOURNAL shall assume and maintain the highest scientific character. It will be absolutely independent in its principles—*fair towards all.* It will depend for its maintenance upon the support given to it by the profession, as it is not published in the interest of any special section or clique.

# BETHLEHEM AND MAPLEWOOD.

**A Contribution to the Medical Climatology of the White Mountains, with Special Reference to their Exemption from Hay Fever.**

By W. H. GEDDINGS, M.D.,
OF AIKEN, S. C., AND BETHLEHEM, N. H.

A PERFECT summer resort should be cool; its atmosphere clear and pure; its water supply free from all danger of contamination; typhoid fever and malaria should be unknown factors; there should be no insects to disturb one's rest; and, lastly, the scenery should be sufficiently attractive to make the visitor contented with his surroundings. Few if any of the hundreds of resorts, which every summer crowd the journals with their seductive advertisements, approach this ideal. There is always something wanting; it is either too hot by day, or too cold at night; or there is imperfect drainage, with all its baneful consequences; or, if none of these are present, the health or pleasure-seeker is tormented by flies during the day or robbed of his rest at night by bloodthirsty mosquitoes.

No resort is perfect; but Bethlehem and Maplewood come nearer to the standard than any other place with which I am familiar. They are within a mile of each other, and it was only a year or two ago that Maplewood assumed an independent existence, with its own post and express offices. Although thus artificially separated, the climate and topography of both places are the same. The White Mountains have been called the Switzerland of America, but aside from the fact that both are mountainous there is no great similarity. But if Germany has her Saxon Switzerland there is no reason why America should not have hers, and although its scenery may lack the grandeur of its older namesake it has charms and beauties of its own which grow upon one with each succeeding visit, for it is a well-known fact that visitors to the White Mountains, after trying other places, almost invariably return, and afterwards seldom care to go elsewhere.

Bethlehem and Maplewood are located on a sort of table land, which, projecting from a range of high hills, keeps off the warm winds from the south. Towards the north this plateau overlooks the beautiful valley of the Ammonoosuck, and, in fair weather, affords a charming view of the far off Stratford Peaks in the State of Maine. On the right Bethlehem and Maplewood are protected from the east winds by Mt. Washington and the other mountains of the lofty Presidential Range. Towards the west the country is rolling, a succession of hills and valleys, the former not high enough to interfere with the view, with the distant Green Mountains of Vermont in the background. The plateau upon which Bethlehem and Maplewood are located, formerly known as Bethlehem Street, overlooks, as we have said, the Ammonoosuck Valley, and, being a hundred feet or so higher, insures excellent facilities for drainage, and as moisture, like water, always seeks a lower level, contributes much to the dryness of these resorts. In the early morning the valley is often filled with fog and mist, while the plateau above is bathed in a flood of bright sunshine. It will thus be seen that the location of Bethlehem affords ample protection against unpleasant and injurious winds without being shut in by too close proximity to high mountains, which cut off the view and add to the humidity, as is the case with many of our mountain resorts. In its natural state the soil is rocky and covered with boulders, but when these latter have been removed, the rich earth produces abundant crops of grass and grain. It is to this fertile soil that we owe the beautiful smooth green lawns which add so much to the charm of our White Mountain landscapes. Owing to the severity of the winters flowers are not abundant, but such as do grow are remarkable for their size and the brilliancy of their colors.

*Water Supply and Drainage.*—Previous to the year 1878 the water supply was inadequate and the drainage imperfect. Like other summer resorts they had to learn by experience, nor were they long in profiting by the lessons. The occurrence of a few cases of typhoid fever with one or two deaths threatened to bring the place into bad repute, and, realizing that in these days no health resort can thrive without good water and drainage, they set to work to remedy the evil. The water from a number of springs back of the town was collected into a reservoir and thence conveyed to the numerous hotels and boarding-houses. This not only afforded an adequate supply of water for household purposes, but also for watering the streets, thus doing away with the dust, which up to this time had been a source of great annoyance. A pipe-drain was run through the streets and thence into the valley below. Almost every house in Bethlehem availed itself of this drain, and since then there has not been a single case of typhoid fever which was not contracted elsewhere. The Maplewood adopted similar measures and with like success, but, finding their water insufficient, they last year obtained it from a cold spring some distance down the hill, which now affords a most abundant supply. The hotels in both places are now provided with well flushed water-closets, thus eliminating all danger from this source.

*Climate.*—My meteorological observations taken at Bethlehem extend over eleven seasons, but I have at present access to only nine of my records. The observations are taken from July 1 to Sept. 15, at 7 A. M., 2 P. M., and 9 P. M. The instruments used were made by Green, of New York, and are the same as those which he furnishes to the U. S. Signal Service.

TABLE NO. 1.—*Mean Temperature of the months of July and August, and first two weeks of September for nine years.*

| | 1878. | 1879. | 1881. | 1882. | 1883. | 1884. | 1888. | 1889. | 1890. | Means. |
|---|---|---|---|---|---|---|---|---|---|---|
| July | 70.39° | 66.71° | 66.87° | 69.45° | 64.27° | 62.00° | 65.40° | 65.90° | 63.20° | 66.04° |
| August | 67.51 | 63.90 | 68.07 | 66.60 | 62.60 | 66.83 | 64.80 | — | 62.40 | 65.34 |
| September | — | 62.27 | 65.23 | — | 52.00 | 72.00 | 65.30 | — | — | 63.36 |
| Means | 68.95 | 64.29 | 66.72 | 68.02 | 59.62 | 66.94 | 65.17 | — | 62.80 | 64.91 |

It will be seen that the mean temperature of the nine seasons is 64.91° F., which is certainly sufficiently low to entitle Bethlehem to claim that she possesses the first attribute of a perfect health resort, a cool atmosphere. With a view to making this climatic feature still more apparent I have prepared the following table, which compares the temperature of Bethlehem with that of several of our summer resorts :—

TABLE No. 2.—*Mean Temperature during July and August of Bethlehem as compared with other summer resorts.*

| | | | | | |
|---|---|---|---|---|---|
| Bethlehem . . . | 65.69° F. | | | | |
| Atlantic City . . | 72.11° F., or 6.42 degrees | warmer | than | Bethlehem. | |
| Cape May . . . | 73.50 | " 7.81 | " | " | " |
| St. Paul . . . . | 70.50 | " 5.01 | " | " | " |
| Colorado Springs . | 67.10 | " 1.31 | " | " | " |
| Asheville . . . | 70.80 | " 5.11 | " | " | " |

The above table comprises all the prominent resorts for which I could obtain the necessary data, and indicates that in point of temperature Bethlehem is one of the most desirable summer resorts in the country. In fact, it would be difficult to find a place with a temperature more conducive to health and comfort.

TABLE No. 3.—*Temperature, monthly maxima and minima and monthly range.*

| | 1878. | | | 1879. | | | 1881. | | | 1882. | | | 1883. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Max. | Min. | Monthly range. | Max. | Min. | Monthly range. | Max. | Min. | Monthly range. | Max. | Min. | Monthly range. | Max. | Min. | Monthly range. |
| July | 85° | 57° | 28° | 80° | 52° | 28° | 90° | 52° | 38° | 83° | 51° | 32° | 85° | 50° | 35° |
| August | 81 | 54 | 27 | 80 | 47 | 33 | 90 | 52 | 38 | 85 | 52 | 33 | 81 | 41 | 40 |
| Sept. | | | | 78 | 47 | 31 | 89 | 51 | 38 | 78 | 45 | 33 | 75 | 40 | 35 |

| | 1884. | | | 1888. | | | 1889. | | | 1890. | | | Means. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Max. | Min. | Monthly range. | Max. | Min. | Monthly range. | Max. | Min. | Monthly range. | Max. | Min. | Monthly range. | Max. | Min. | Monthly range. |
| July | 82° | 51° | 31° | 81° | 47° | 34° | 81° | 56° | 25° | 85° | 52° | 33° | 83.5° | 51.9° | 31.5° |
| August | 87 | 54 | 33 | 80 | 48 | 32 | | | | 86 | 49 | 37 | 84.0 | 49.5 | 34.1 |
| Sept. | 82 | 54 | 28 | 70 | 36 | 34 | | | | | | | 82.0 | 45.5 | 33.1 |
| | | | | | | | | | | | | | 83.1 | 48.9 | 32.9 |

This table gives the monthly means of the maximum and minimum temperature of each month of the period of observation, and the mean monthly range; or, in other words, the average difference between the highest and the lowest temperature observed during the month. This must not be confounded with the absolute maximum and minimum, which represent the highest and lowest figures observed during the whole of the nine years, which, being exceptional, are of less importance than the data given in Table 3. It will be seen that the average maximum for the whole period, that is the average highest point to which the mercury rose during all of the months of the period, was 83.1° F. It should be remembered that these high temperatures, or even the approach to them, occurred only once or twice a month; and the same may be said of the monthly minima. The highest reading of the thermometer, the absolute maximum, 90 degrees, was observed in 1881, and since then it has not risen above 87 degrees. A much better criterion of a climate is afforded by the daily range; but this I can give for only two years, as I have not had time to calculate it for a longer period. The results will be found in the following table:—

TABLE No. 4.—*Daily range of Temperature.*

| | 1888. | 1890. | Means. |
|---|---|---|---|
| July | 11.4° | 9.9° | 10.6° |
| August | 9.3 | 10.9 | 10.1 |
| Daily means of July and August for two years | | | 10.3 |

A daily variation of only 10 degrees represents an amount of equability seldom met with in mountain climates, especially in one as dry as that of Bethlehem. In Denver, the range for the same months is 24 degrees; and at Atlantic City, 14 degrees; so that Bethlehem may be regarded as especially favored in respect to equability, which is so essential to the comfort of the well, and to the recovery of the sick.

*Relative Humidity.*—The amount of moisture in the air is almost as important as its temperature. Light and heat emanate from the sun, but aqueous vapor comes from the earth itself, the amount present varying with the temperature, being modified by the character of the soil, the configuration of the earth, and especially by the proximity of large bodies of water. The amount of moisture in the atmosphere is usually determined by its relative humidity, or the proportion of aqueous vapor present in it as compared with the greatest amount that it is capable of containing at a given temperature; in other words, its percentage of saturation.

TABLE No. 5.—*The relative Humidity of Bethlehem and Maplewood for five seasons.*

| | 1879. | 1882. | 1884. | 1888. | 1890. | Means. |
|---|---|---|---|---|---|---|
| July . . . . | 60.20 | 63.40 | 64.50 | 69.99 | 63.80 | 64.30 |
| August . . . | 56.80 | 56.26 | 64.10 | 72.78 | 72.80 | 64.54 |
| September . . | 63.90 | — | 63.90 | 75.30 | — | 67.70 |
| Means . . . | 60.30 | 59.83 | 64.17 | 72.69 | 68.30 | 65.51 |

A relative humidity of 69.5 indicates that the climate is fairly dry, and in this respect Bethlehem is unsurpassed by any summer resort in the United States, except those located between the Rocky Mountains and the Sierras, in proof of which I append the following table:—

TABLE No. 6.—*The relative Humidity of Bethlehem as compared with other summer resorts and cities of the United States, July and August.*

| | July. | August. | Means. | Difference. |
|---|---|---|---|---|
| Bethlehem . . . | 64.30 | 64.54 | 64.40 | |
| Asheville . . . . | 78.73 | 80.54 | 79.93 | 15.23 greater than Bethlehem. |
| Boston . . . . . | 76.00 | 78.50 | 77.25 | 13.10 " " " |
| Cape May . . . . | 78.70 | 74.50 | 76.60 | 12.20 " " " |
| Chicago . . . . | 70.10 | 71.20 | 70.65 | 6.25 " " " |
| Denver . . . . | 46.60 | 46.90 | 46.75 | 17.65 less " " |
| San Diego . . . . | 76.40 | 77.10 | 76.75 | 12.35 greater " " |
| Newport . . . . | 77.80 | 79.60 | 78.70 | 14.30 " " " |
| New York . . . | 70.40 | 71.10 | 70.75 | 6.35 " " " |

*Rainfall and Weather.*—The amount of rain has never been measured at these resorts; but there is no reason to believe that it differs from that of the adjacent country, which is 2.5 inches in July, and 4.5 inches in August, giving a mean of 3.5 inches for each month of the season. As most people go into the country to enjoy the life out of door, the time over which the rain is distributed is of much more importance than the amount that falls. I have no record of the time during which rain fell; but the following table, giving the so-called "Invalid Day," or the proportion of the day that a delicate person could pass out of doors, will, in a measure, supply the missing date.

TABLE No. 7.—*Number of days an invalid may pass out of doors in the months of July and August.*

| | Whole days. | | Three-quarter days. | | Half days. | | Quarter days. | | No part of days. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | July. | Aug. | July. | Aug. | July. | Aug. | July. | Aug. | July. | Aug. |
| 1878 . . | 22 | 25 | 5 | 2 | 1 | 4 | 0 | 0 | 2 | 0 |
| 1879 . . | 27 | 26 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 4 |
| 1882 . . | 25 | — | 1 | — | 2 | — | 6 | — | 2 | — |
| 1888 . . | — | 23 | — | 3 | — | 4 | — | 0 | — | 2 |
| 1890 . . | 27 | — | 1 | — | 0 | — | 2 | — | 1 | — |
| Means . . | 25.2 | 24.3 | 1.7 | 2.0 | 1.0 | 2.7 | 1.0 | 0.0 | 1.7 | 2 |

It will be seen by the above that there were, on the average, only two days each month on which an invalid could not go out with safety and comfort; and that on twenty-five days he could pass the whole of his time in the open air. It should be remembered that the days on which the invalid could not go out were not necessarily rainy days, as in making up the table bleak and windy days were also taken into consideration.

Fogs, although quite frequent in the early morning, in the valley below, seldom rise to the level of Bethlehem.

*Winds.*—By consulting the following table it will be seen that the prevailing wind is from the southwest, and is supposed to come through the Franconia Notch. Of the 869 observations 340 were from the southwest, and 210 from the west. In other words, the wind was from these quarters 550 times. Adding 128 from the northwest, we find that the wind was from southwest to northwest 673 times out of 869. The comparative absence of easterly winds is due, as previously stated, to the protection afforded by the high Presidential range.

TABLE No. 8.—*Direction of the Wind during July and August for five years.*

| | July. | | | | | Totals. | August. | | | | | Totals. | Totals for both mos. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1878. | 1881. | 1882. | 1888. | 1890. | | 1878. | 1881. | 1882. | 1888. | 1890. | | |
| S. W. . . | 25 | 40 | 37 | 27 | 41 | 170 | 35 | 36 | 26 | 57 | 26 | 170 | 340 |
| W. . . | 38 | 18 | 30 | 11 | 15 | 112 | 38 | 18 | 14 | 11 | 17 | 98 | 210 |
| S. . . . | 7 | 2 | 0 | 5 | 7 | 21 | 7 | 1 | 10 | 0 | 6 | 24 | 45 |
| N. W. . . | 12 | 14 | 7 | 2 | 16 | 51 | 12 | 19 | 25 | 9 | 12 | 77 | 128 |
| N. E. . . | 2 | 10 | 12 | 7 | 4 | 35 | 2 | 9 | 3 | 4 | 5 | 23 | 58 |
| N. . . . | 4 | 5 | 4 | 0 | 2 | 15 | 4 | 4 | 9 | 0 | 5 | 22 | 37 |
| S. E. . . | 2 | 1 | 0 | 8 | 4 | 15 | 2 | 0 | 1 | 4 | 4 | 11 | 26 |
| E. . . . | 3 | 1 | 2 | 0 | 2 | 8 | 3 | 6 | 1 | 4 | 3 | 17 | 25 |
| Totals . . | 93 | 91 | 92 | 60 | 91 | 427 | 93 | 93 | 89 | 89 | 78 | 442 | 869 |

*Purity of the Atmosphere.*—Owing to the sparseness of their population, and to the fact that there are no factories in their immediate vicinity, Bethlehem and Maplewood are blessed with an atmosphere remarkable for its purity. No microscopical or chemical examination of the air has ever been made; but, judging by ordinary signs, there is every reason to believe that the atmosphere is quite free from organic impurities, a conclusion which is strengthened by the absence of typhoid fever and other diseases due to filth and crowding.

*Altitude.*—Both places are about 1459 feet above sea level, and as the physiological effects of diminished pressure are not manifested until an elevation of 2000 feet is reached, they cannot be ranked as Alpine resorts, but are rather what the Germans would call *Sommer Frischen.*

*Absence of Annoying Insects.*—During the season both Bethlehem and Maplewood are entirely free from mosquitoes. I say during the season, because in the latter part of June a few of these pests do straggle in from the adjacent woods. They are, however, very weak, and disappear as soon as the visitors begin to come in. I do not remember having seen one after July 4th. In the latter half of August the domestic house-fly makes its appearance. They are, however, less numerous than at most summer resorts, and do not stay long, the cool weather of September putting an end to their brief existence. Owing to the habitual cleanliness of the New England housewife, visitors are seldom annoyed with bedbugs, and fleas are rarely met with, and for the same reason.

*Indications.*—In addition to being pleasant and attractive summer resorts, Bethlehem and Maplewood are well adapted to the climatic treatment of a number of diseases, of which the following are the most important:—

*Hay Fever.*—For many years the White Mountains have been the Mecca of the victims of this intractable disease. Failing to obtain relief from ordinary treatment, they naturally flocked to this region, which offered them more or less complete exemption from their distressing malady. In 1873 they organized themselves into what is now widely known as the United States Hay Fever Association, with headquarters at Bethlehem. Here they meet year after year, compare notes, discuss remedies, and, what is perhaps even more important, determine the degree of exemption enjoyed by places claiming to be hay fever resorts. A list of such places is kept, and whenever such a place is found through the experience of its members to have lost its immunity it is marked with a *, and from that time on forfeits the indorsement of the Association. There can be no doubt that the exempt region is becoming every year more contracted, as many resorts formerly frequented by hay fever patients have been gradually abandoned by them because they ceased to afford the desired relief. An old and very clever practitioner in this section, with whom I was discussing the matter, attributed the loss of exemption to the extension of the railroads, which now permeate this district to its remotest corners. I am inclined to think that he was correct. The cars are loaded in a section the atmosphere of which contains the seeds of plants whose pollen is known to induce paroxysms of hay fever. These cars remain tightly closed until they reach their destination in the hitherto exempt region, when they are unloaded and exposed to the wind, which wafts the adherent seeds over adjacent fields, where they grow and multiply, and in time cause the disease in a section which has hitherto enjoyed exemption. This I have myself observed to a limited extent in the neighborhood of recently established railway stations; and can readily understand how, in the course of time, a large extent of country may thus lose its exemption. Fortunately, Bethlehem and Maplewood are not on the main line, but on a narrow gauge road, which necessitates the reloading of freight at the junction. Be this as it may, both places continue to enjoy almost complete exemption, while other places not over five miles distant have lost it.

The effect of change to an exempt region is sometimes very prompt and marked. I remember being called one afternoon to a German who had just arrived. He was in the greatest distress, his face swollen and suffused, his eyes were like two coals of fire, and his naturally large nose was swollen to twice its original size, while from both organs there flowed an almost uninterrupted stream of clear watery fluid. His asthma was at its height, and as he sat up in bed, with his head thrust forward, gasping for breath, he presented a truly pitiable aspect. His wife, very much distressed, and evidently disappointed that he was not immediately relieved, forgetting that she had not been in the place longer than half an hour, was anxious to go somewhere else. I asked her "where she would go?" "To the top of Mt. Washington," she naively replied. With some difficulty I succeeded in persuading her to give the place a trial. The next morning, while preparing to give my patient an early visit, a gentleman, apparently a perfect stranger, walked into my office. So completely was he transformed that I experienced some difficulty in recognizing my patient of the evening before, entirely relieved, and who had called thus early to save the expense of a second visit.

Bethlehem and Maplewood enjoy as complete exemption from hay fever as any resort in the United States; but there are certain thus far undefined conditions of the atmosphere during the prevalence of which a limited number suffer with slight symptoms of their malady. There is only one form of climatic treatment which affords greater relief than these places, and that is a trip to Europe. Those suffering with the early form of the disease, the so-called "Rose Cold," should come early in June, and remain a little over a month, while those with the autumnal variety need not reach the mountains before the middle of August, but should stay until the early frosts destroy vegetation sufficiently to do away with all danger from the inhalation of the irritating pollen. Many leave sooner, but these prefer risking a few attacks to neglecting their business any longer.

*Convalescence from Long and Exhausting Diseases.*—It is in this class of cases that summer resorts are invaluable, especially those of moderate elevation with a cool atmosphere like the places which form the subject of the present article. The appetite is invigorated, the strength improves rapidly, and the duration of the convalescence is often shortened by at least one-half. It is among such as these that the most satisfactory results are obtained.

*Exhaustion from Care and Overwork in Business.*—The average American is seldom an idle man; on the contrary, he usually works too much and too fast. Absorbed in his business he neglects the calls of nature, bolts his meals, and devotes little or no time to physical exercise. As a consequence of all this he becomes weak and dyspeptic, sleeps badly, and sooner or later becomes a burden to himself and friends. To such men a residence of a month or two in the mountains is a priceless boon, and may, if availed of soon enough, be the means of warding off that miserable train of symptoms known as *nervous prostration*, which when once established is so difficult to overcome.

*Phthisis.*—My experience with this disease has been very extensive, and I think that I may safely say that there is no summer resort where invalids of this class do better than at Bethlehem and Maplewood. When not instructed by their home physician to do otherwise I have advised my consumptive patients at Aiken to continue their treatment during the summer at these places, and almost always with good results. Although not so dry as Aiken, the climate of the three resorts has much that is common to them all. The weaker patients can pass much of their time out of doors without risking the dangers of over-exertion, while for the stronger ones the neighboring hills and mountains afford every grade of ascent, from the slightest incline to one which forces the patient to take deep inspirations, and thus expand and ventilate the lungs. Hæmoptysis is no contraindication. The altitude of Bethlehem corresponds with that of Goebersdorf in Silesia, the site of Dr. Brehmer's sanatorium, in which he lost only four patients from hemorrhage out of three thousand cases of phthisis treated there. I have been occasionally consulted by consumptive residents of this region as to the propriety of their going to the south, but knowing that their means were too limited to afford them good board, I have advised them to winter at home, counselling them to live in a room looking towards the south, with an open fire-place in which wood is burned, and, if possible, flanked by rooms heated in the usual manner. The number thus treated is too small to admit of any definite conclusion, but the results thus far have been very satisfactory. The beneficial results achieved in this disease by a residence in the mountains are so generally conceded as to render further comment unnecessary.

*Other Diseases of the Respiratory Organs.*—The late epidemic of influenza has left a number of persons in whose cases the restoration to health has been more or less incomplete, leaving behind partially resolved pneumonias, pleuritic exudations, and bronchitis in its varied forms. To all such cases the dry stimulating air of the mountains will give a fresh start on the road to recovery. This climate often affords marked relief of asthma and in many cases of chronic bronchitis.

*Cardiac Diseases.*—The altitude of Bethlehem being only 1459 feet, its climate is not contraindicated in diseases of the heart, 1600 feet being the elevation at which the effects of diminished pressure begin to manifest themselves.

*Diseases of the Stomach and Intestines.*—In cases which, like these, require an abundance of pure invigorating air with ample opportunity for exercise, there can be no doubt of the efficacy of a climate such as we have described. In one respect, the climate of Bethlehem is very like that of the ocean in causing constipation, until one becomes accustomed to it. This peculiarity may be utilized with advantage in cases of chronic diarrhœa.

*Diseases of the nervous system* of an asthenic type as a rule do well in the mountains, but great care should be exercised in the selection of cases not to send such as require a mild sedative climate.

*Diseases of Females.*—Many diseases of this character do well in this climate, but patients of this class should be warned against too long drives in the rather rough mountain wagons, which are almost universally used in making extended excursions. The same caution applies to pregnant women, in whom I have had to attend several cases of abortion induced by the rough jolting of these wagons.

*Diseases of Children.*—At no resort have I known children to thrive as they do here. They gorge themselves with what would elsewhere be regarded as the most indigestible food, with perfect impunity, they get soaked to the skin and rarely take cold, and there appears to be no limit to their endurance of fatigue. I have known weeks to elapse with both places crowded with children without my being called to one of them. Cases of cholera infantum, especially if contracted near the coast, recover promptly when removed to the mountains, while those already convalescent regain their strength with surprising rapidity.

The above is only a partial enumeration of the diseases which experience has shown to be benefited by a residence in this section. Space will not admit of my going into further detail, and I can only repeat, in general terms, that the climate of Bethlehem and Maplewood will be found to be indicated in all diseases requiring a cool, dry, and moderate atmosphere.

ACCOMMODATIONS.—Bethlehem proper consists of one large hotel, The Sinclair, about twenty-five smaller ones, and a number of cottages, nearly all of which are occupied by visitors during the season. With so large a number to choose from, one will experience no difficulty in finding accommodations agreeable to his taste, and commensurate with his purse. The Maplewood is private property, having been founded by the late Mr. Isaac Cruft, of Boston, who, with modest beginnings, has gradually built up one of the most beautiful and attractive resorts in the country. The main feature of the place is the magnificent Maplewood Hotel, an establishment with all the appointments of a first-class modern hotel, and located in the midst of attractively laid out grounds.

Opposite the hotel proper is the Maplewood Cottage, a smaller hotel for the accommodation of those who cannot afford to pay for the luxury of the larger establishment, but in every respect very comfortable.

Another establishment, still incomplete, but which may be opened during the coming season, is The Hall, which is intended for quiet families, who do not care for the gayety of the hotel. Scattered over the grounds are cottages of various sizes, which are rented to families, who either keep house for themselves or take their meals at the hotel. On the grounds, for the amusement of all their guests, is the Casino, a very handsome structure, with a large hall for concerts and other entertainments, bowling-alleys and billiard-tables for both sexes, and a neat library and reading-room.

SEASON.—The season opens about July 1st, but The Sinclair and several other houses are ready for the reception of guests early in June. This is done for the accommodation of the "rose cold" sufferers. The season may be said to be at its height after the advent of the hay fever victims, who begin to come in about the middle of August, and continues to about the month of September, when many leave to place their children at school. A few of the hay fever contingent remain until late in October, but the number is very small, which is much to be regretted, as this is the finest month of the year.

SUMMARY.—It will be apparent from the above description that Bethlehem and Maplewood possess nearly all the attributes of a perfect summer resort, which, as was stated at the commencement of this article, are a cool, pure, and clear atmosphere; a water supply free from all danger of contamination, with adequate drainage; freedom from malaria and typhoid fever; absence of insect pests, excepting a late visitation of flies; and surroundings sufficiently beautiful to satisfy the most fastidious taste.

# OBSERVATIONS ON THE USE OF "KOCH'S TUBERCULIN" IN THE TREATMENT OF PULMONARY TUBERCULOSIS IN BELLEVUE HOSPITAL.

By ALFRED L. LOOMIS, M.D., LL.D.,
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I DESIRE to present a tabulated statement, with brief histories, of thirteen cases of pulmonary tuberculosis, treated with Koch's tuberculin, in Bellevue Hospital, from December 18, 1890, to March 11, 1891, with conclusions which I have reached from such experience. The table and the accompanying abstracts of the histories have been taken from the record-books of the University Division of the Hospital by Dr. C. E. Knight, Senior Assistant of the Division.

The inoculations in the cases reported were made by Drs. H. S. Stearns and H. P. Loomis.

The sputum examinations were made by Drs. I. D. Byron and E. Le Fevre.

Of these thirteen cases, seven were in the first stage (or stage of consolidation without softening), two were in the second stage (or stage of consolidation with softening), and four in the third stage (or stage of softening with excavation).

Of those included in the *first class*, the maximum age was 35 years, the minimum 22, the average age 28. The average duration of disease at the time of beginning of treatment was thirteen and a half months. The largest number of injections given to any case in this class was 77; the average amount of each injection was .0019 grm.

At the end of the treatment the general condition of each of these cases was improved. All gained in weight; the greatest gain was 14½ pounds, the least 3½ pounds, and the average gain was 8½ pounds. In four cases the cough and expectoration almost entirely disappeared and the nightsweats ceased. In all but two the examination of the sputum showed a diminution in the number of bacilli to the field.

In every one of these cases the physical signs indicated that, for a period varying from four to twelve days after the first injection, the activity of the pathological processes in the affected pulmonary areas was markedly increased. This activity after the second week gradually subsided, and by the end of the third week all signs of activity in the phthisical process had ceased and the diseased areas gave the usual evidence of arrested phthisis. In three cases, at the last examination, the change in the physical signs varied but little from those noted at the first examination before the beginning of treatment. In two cases vesicular breathing was heard over the diseased area. In two the signs of consolidation had increased, and the rales were more numerous than at the first examination.

In one case, at the last examination, the physical signs of cavity were present, where bronchial breathing only was heard at the time of the commencement of the treatment.

Of the two cases included in the *second class*, one died thirty-six days after the beginning of the treatment of disseminated tuberculosis (tubercles being found at the autopsy in all the organs of the body).

The other case gained 4½ pounds in weight; his strength improved and his nightsweats became less frequent, his expectoration more abundant and the number of the bacilli increased. The physical examination of his chest, four weeks after treatment was stopped, indicated the existence of a large cavity in the pulmonary area, the original seat of the tubercular infiltration. Of the four cases included in the *third class* the average age was 35 years, the average duration of the disease at the time of the beginning of the treatment was four months and two weeks, the average duration of treatment was eleven weeks.

The greatest number of injections given to any one case in this class was 74, the least number 46; the average amount of each injection was .0007 milligrams.

One case died during the sixth week of treatment with extensive pulmonary infiltration, softening and cavity. The greatest gain in weight in any one in this class was 15¾ pounds, the least

6 pounds, the average gain 9 pounds. In all but one of this class, the cough and amount of daily expectoration were not appreciably changed. In one they diminished. In one the night-sweats ceased. In all the activity of the pathological processes as indicated by the physical signs markedly increased after the second injection. The comparison of the physical signs before and after treatment shows that in two cases the moist sounds had disappeared and the cavities had become dry, indicating the arrest of the phthisical processes. In the other case, the physical signs showed an extension of the disease. In none of this class was there any appreciable change in the number of the bacilli. One case was under treatment only eleven days and left the hospital; no bacilli were found in his sputum.

From my observations of these cases and others in private practice I am forced to the following conclusions:—

1st. That we have in Koch's tuberculin an agent which excites active changes in tubercular areas as indicated by the changes in the physical signs: That the nature and extent of these changes vary with the amount of the fluid injected and the frequency with which the injections are repeated: That if large quantities are given, sufficient to produce marked reactions where large tubercular areas exist, rapid extension of the disease occurs, followed by softening and the signs of acute phthisis.

2d. If small injections, varying from a $\frac{1}{10}$ to 1 milligram, are used at long intervals, while no fever of reaction is produced, though activity in the tubercular areas as indicated by changes in the physical signs may follow each injection, it soon subsides (no injection should be given until the reacting fever has subsided), the activity in the tubercular processes is in most instances arrested, and, if the nutrition of the patient is fully maintained by an abundance of easily digested and nutritious food, and by good hygienic conditions, the usual evidences of arrested phthisis are soon reached.

I am convinced that there is no method which so effectually maintains the nutritive processes in the pulmonary tissue during the use of the tuberculin as the pneumatic cabinet, used according to the plan proposed by Dr. C. E. Quimby.

3d. While the number of bacilli in the sputum was slightly diminished in most of the cases treated, in no case did they entirely disappear, and it seems evident that the number of bacilli in the sputum cannot be taken as a reliable indication of the effects of the tuberculin on the phthisical processes; nor do I believe that it is necessary that they shall entirely disappear from the sputum of phthisical subjects in order that they may be classed as cured, for in those cases of phthisis which have been under my observation where recovery has taken place under climatic and hygienic influences after all active signs of the disease have been absent for a long period—in one case as long as ten years, the individual being apparently in perfect health—bacilli have been found in the expectoration.

4th. While in the majority of our cases an arrest of the tubercular processes has followed the use of the tuberculin, sufficient time has not elapsed to venture an opinion as to the permanency of such arrest.

5th. In a minority of our cases, the use of the tuberculin has been followed by great activity in the original tubercular areas and a rapid development of new areas; in two instances its use was followed by signs of acute general tubercular infection, which rapidly precipitated a fatal issue.

In conclusion, I venture to state that a longer and more careful experience is required for the proper and safe use of this agent than for that of any other therapeutic agent which has been given to the profession; that while the expectations of Prof. Koch may not be fully realized, I believe that after this agent has passed through the siftings of careful and experienced clinicians it will take a permanent place among the aids for the cure of pulmonary tuberculosis.

## ABSTRACT OF CASES TREATED.

(1.) *Mary Davids.* Age 22. Admitted Dec. 18, 1890. No family history of tuberculosis. Cough began one year ago. Temperature from 99°–102°. Has occasional nightsweats.

Physical examination. Left apex, behind feeble inspiration. In front inspiration accompanied by fine rales. Right apex, behind slight tubular expiration. In front normal vesicular breathing. Weight, 128½ pounds. Sputum, 25 to 50 bacilli to the field.

4th day of treatment. In front at left apex respiration slightly bronchial. Rales larger and more abundant.

11th day. Bronchial breathing at both apices behind. Examination of sputum, 3 to 8 bacilli to the field.

End of treatment. No bronchial breathing at the right apex behind or in front; no rales. Left apex, slight bronchial breathing and sharp rales on coughing behind. No bronchial breathing or rales in front. Patient coughs and expectorates very little, is much stronger, temperature normal, has no nightsweats. Weight, 132 pounds, a gain of 3½ pounds. Sputum, 5 to 8 bacilli to the field.

Number of injections, 55. Average amount, .001 gm.

Under treatment 11 weeks.

(2.) *John Dyer.* Age 30. Admitted Dec. 17, 1890. Mother died of phthisis. Cough began one year ago. One month ago had profuse hæmoptysis. He is weak and unable to work. Temperature rises to 103° in evening.

Physical signs. Feeble inspiration, expiration broncho-vesicular, and fine, crackling rales at the end of expiration in the infra-clavicular region of the right side. Weight, 131 pounds. Examination of sputum, 40 to 50 bacilli to the field.

4th day of treatment. After the second injection the rales in right infra-clavicular region are much more numerous and are now for the first time heard behind. Examination of sputum, 50 to 100 bacilli to the field. Patient has profuse sweats.

8th day. All rales behind have disappeared, but there is bronchial expiration at the right apex. Number of bacilli, 50 to 100 to the field.

At end of treatment. Patient's general condition improved; he is stronger, has little cough, and no temperature or night-sweats. Weight, 142½ pounds, a gain of 11½ pounds. Sputum, 15 to 20 bacilli to the field. Very little change in the physical signs since the last examination.

Total number of injections, 47. Average amount, 0.001 gm.

Under treatment 10 weeks.

Six weeks after treatment. Distinct improvement in general condition. Coughs and expectorates little. He looks well, works every day, and says that he feels as well as ever. Weight, 143½ pounds.

Physical examination. Feeble respiration and a few fine, crepitating sounds on coughing in infra-clavicular region of right side. No other signs of disease.

(3.) *Joseph Quinn.* Age 29. Admitted Dec. 18, 1890. Brother and sister died of phthisis. Cough began three years ago. First hemorrhage one year ago. Has lost flesh rapidly, has fever and nightsweats, is weak, and suffers from dyspnœa.

Physical signs. No vesicular breathing; bronchial expiration at left apex. Inspiration accompanied by fine rales. Evidences of an old pleurisy over lower part of left lung. Weight, 118 pounds. Examination of sputum, 15 to 20 bacilli to the field.

3d day of treatment. After second injection evidence of consolidation extending over the whole of the left lung, with abundant moist rales at the apex.

7th day. Rales less numerous.

End of treatment. Coughs and expectorates very little, has occasional nightsweats. Weight, 132½ pounds, a gain of 14½ pounds. Examination of sputum, 8 to 10 bacilli to the field.

Physical examination. Broncho-vesicular breathing at the left apex. Pleuritic friction over lower portion of lung.

Number of injections, 23. Average amount, 0.005 gm.

Under treatment 11 weeks.

Five weeks after end of treatment. Looks well, coughs and expectorates very little, has some pain in left side. When he entered the hospital he was unable to work, but is now doing hard work every day. Weight, 125½ pounds, a loss of 7 pounds since he left the hospital.

Physical signs. Feeble inspiration over the entire left side. At left apex no bronchial breathing.

(4.) *Albert Funk.* Age 24. Admitted Dec. 17, 1890. Father, brother, and two sisters died of phthisis. Cough began one year ago. Has fever and nightsweats; is weak and unable to work.

Physical signs. Dulness at both apices. Left apex, in front. Broncho-vesicular respiration, and mucous rales. Right apex, rude respiration. Behind, left apex, high pitched breathing and mucous rales. Weight, 120 pounds. Sputum, 3 bacilli to the field.

4th day of treatment. Physical examination. Bronchial breathing and many moist rales at both apices behind; large mucous rales on left side anteriorly.

6th day. Expectorated 2 mouthfuls of blood.

Physical signs. Rales have disappeared on the right side behind. Few rales in front; left side same as at previous examination. Examination of sputum, 25 bacilli to the field.

33d day. Behind rales on the left side, vesicular murmur more distinct.

39th day. Behind, left side, no rales and no evidence of consolidation at apex. On the right side respiration dry and blowing.

End of treatment. Physical examination. Few dry inspirations in front on the left side. Behind, broncho-vesicular respiration at left apex. Weight, 127 pounds, a gain of 7 pounds. Cough and expectoration diminished; has occasional night-sweats. Sputum, 4 to 6 bacilli to the field.

Three weeks after treatment. Weight, 124. General condition about the same as the end of treatment.

Physical signs. Broncho-vesicular breathing and mucous rales in front at left apex. Behind, at right apex, hollow tubular breathing and a few respiratory rales.

Under treatment 13 weeks.

Number of injections, 77. Average amount, 0.001 gm.

(5.) *John Owens*. Age 32. Admitted Dec. 15, 1890. Family history good. Cough began 3 months ago. Consolidation at both apices, but no rales. Weight, 117½ pounds. Sputum bacilli, 1 to 2 to the field.

Dec. 26, 3d day of treatment. Abundance of rales at the right apex.

End of treatment. Cough has almost disappeared. There has been no sputum during the last week, therefore cannot make an examination of sputum. Weight, 121½ pounds, a gain of 4 pounds.

Physical signs. No change since the last examination.

Number of injections, 6. Average amount, .003 gm.

Under treatment 11 days.

(6.) *Thomas Temple.* Age 35. Admitted Sept. 18, 1890. No family history of tuberculosis. Cough began six months ago. Temperature from 99°–100°.

Physical examination. Left side, in front, prolonged expiration. Right rude respiration. Left behind, tubular breathing in scapular region. Right tubular expiration, but not so marked as on the left. Weight, 127 pounds. Sputum, 50 bacilli to the field.

4th day of treatment. Bronchial breathing at both apices behind.

12th day. Behind at right apex bronchial breathing, resembling amphoric but no amphoric whisper. Left side rales. Sputum bacilli, 40 to 45 to the field. Weight, 126 pounds.

End of treatment. Last examination. Bronchial breathing at both apices with a few sticky rales on the left on coughing. Weight, 132 pounds. Sputum, 100 bacilli to the field. Cough diminished, no nightsweats, and feels much stronger than when he came to the hospital.

Under treatment 10 weeks.

Number of injections, 63. Average amount, ½ to 1 mgr.

Four weeks after treatment. Has had several hemorrhages since treatment stopped, and does not feel so well. Weight, 126¾ pounds.

Physical examination. In front dry tubular breathing on both sides. Behind, left apex dry cavernous (?) breathing.

(7.) *Edward Atwood.* Age 33. Admitted Dec. 29. Mother died of phthisis. Cough began one month ago. Three weeks ago had slight hemorrhage. During the last two months he says that he has lost 40 pounds. Temperature, 99°–103°. His throat is tender and swollen. He cannot speak above a whisper. Weight, 104½ pounds. Sputum, 3 to 8 bacilli to the field.

Physical signs. In front at left apex well-marked broncho-vesicular breathing, with abundance of mucous rales at the right apex; exaggerated rude respiration. Behind. Spot of softening at the left apex; (?) bronchial respiration, large and small mucous rales. On right, bronchial expiration and some very fine rales heard on coughing.

12th day of treatment. Physical signs unchanged. Bacilli 8 to 10 to the field. Weight, 104 pounds.

18th day. Moist rales less numerous and signs of softening disappearing.

End of treatment. In front on left side broncho-vesicular breathing with crackling rales. Behind, some evidences of softening. Left side unchanged. Weight, 109 pounds.

Number of injections, 48. Average amount, .001 gm.

Under treatment 10 weeks.

No improvement in voice, otherwise marked improvement.

Four weeks after treatment. Has no pain in chest, few nightsweats, cough has diminished. When he came to the hospital he was unable to do any work, but can now do any light work and work all day. No improvement in voice. Weight, 108 pounds.

Physical signs. Left apex behind some vesicular breathing. Right behind. Blowing tubular expiration, numerous rales on coughing. In front on right gurgles. Left side in front no veiscular breathing, abundance of rales and pleuritic crepitations.

SECOND STAGE.—(8.) *Martin Dowling.* Age 38. Admitted Dec. 23, 1891. Family history good. Cough began six weeks ago. Infiltration upper third of both lungs, abundance of liquid rales, hot, constant pains, and nightsweats. Weight, 141½ pounds. Sputum bacilli, 40 to 50 to the field.

5th day of treatment. Rales less liquid, and bubbling bacilli 20 to 30 to the field.

28th day. Rales are more numerous. Signs of softening at the left apex.

29th day. Had hemorrhage, expectorated blood. Signs of infiltration throughout both lungs. Pulse feeble and irregular. Weight, 136 pounds. Injections stopped.

36th day. Died.

Number of injections, 24. Amount, from ¼ to ½ mgr. Last injection ten days ago.

Autopsy. Tubercles were found in the lungs, brain, liver, right kidney, spleen, retro-peritoneal glands, and in the intestines tubercular ulcers. For more complete report of autopsy see article by Henry S. Stearns (Medical Journal, March 7, 1891).

THIRD STAGE.—(9.) *Maggie Brown.* Age 27. Admitted Dec. 8, 1890. Cough began five weeks ago. Has lost considerable flesh. Has fever, nightsweats, but little cough.

Physical examination. Consolidation at both apices. Sharp, high pitched rales like small gurgles at inner angle of scapula of right side. Weight, 79 pounds. Sputum, 10 to 15 bacilli to the field.

4th day of treatment. Consolidation at the left apex more evident and rales are more numerous. Right side is unchanged.

6th day. Consolidation on left side extending downward.

8th day. Rales on the right side less numerous.

End of treatment. General condition improved, is stronger, and says she feels very much better. Weight, 94¾ pounds. Sputum, 15 to 20 bacilli to the field. Rales less liquid, vesicular sounds more distinct.

Number of injections, 74. Average amount, .0005 gm.

Under treatment 13 weeks.

Three weeks after treatment. Feels stronger, cough and expectoration diminished. Weight, 96 pounds, a gain of 1¼ pounds since the end of treatment.

Physical signs. Right side behind amphoric breathing, no gurgles left side, at apex tubular breathing, and fine rales on coughing.

(10.) *Louisa Emmons.* Age 40. Admitted Jan. 20, 1891. Family history negative. Cough began about one year ago. She has lost a good deal of flesh, has fevers, nightsweats, and suffers from pain in the infra-scapular region of the left side. Weight, 126 pounds. Examination of sputum, 5 to 8 bacilli to the field.

Physical signs. Evidences of small cavity at right apex. Pleuritic crepitations over anterior surface of right lung. Left lung normal.

37th day of treatment. Some increase in the number of rales, otherwise no change. Sputum, 30 to 40 bacilli to the field. Weight, 132½ pounds.

Under treatment 8 weeks.

Number of injections, 46.

End of treatment. Physical signs unchanged. Weight, 132 pounds.

Four weeks after treatment. Weight, 127 pounds. Better than when she came to the hospital.

Physical examination. In front on right amorphic breathing, gurgles on coughing.

(11.) *George Guiles.* Age 19. Admitted Dec. 21, 1890. Father and one brother died of phthisis. Cough began three months ago, since which time he has lost 15 pounds. Has nightsweats, is thin, anæmic, and badly nourished. Weight, 104½ pounds. Examination of sputum, 5 to 10 bacilli to the field.

Physical signs. Right side behind. Bronchial breathing and large and small mucous rales on coughing in supra-scapular and scapular region. Left side. High pitched expiration at the inner border of scapula; no rales.

2d day of treatment. Signs of cavity at right apex, rales, and fine gurgles. Rales with tubular expiration at left apex.

8th day. Rales less numerous, other signs unchanged since last examination.

36th day. Dry, cavernous breathing on right side behind; other signs unchanged.

End of treatment. No change in cough or number of bacilli. Nightsweats have ceased. Weight, 110½ pounds.

Number of injections, 60. Average amount, .0005 gm.

Under treatment 12 weeks.

Four weeks after treatment. Weight, 112 pounds. Cough and expectoration unchanged. Is stronger and appears very much better.

Physical signs. Right side behind, dry, cavernous breathing, gurgles on coughing. Left apex, bronchial expiration.

(12.) *Christopher Darcy.* Age 47. Admitted Dec. 10, 1890. Family history negative. Slight hemorrhage three months ago. Cough began two weeks ago. Suffers from dyspnœa. Fever and nightsweats.

Physical examination. Consolidation at both apices. Mucous rales on left side anteriorly. Weight, 113 pounds. Sputum, 1 bacillus to the field.

4th day of treatment. Rales resembling gurgles at inner angle of scapula on right side.

6th day. No rales on the right side behind. In front rales quite numerous. Sputum, 1 to 3 bacilli to the field. Weight, 115 pounds.

10th day. Evidences of cavity at left apex. Weight, 118 pounds.

16th day. Treatment stopped.

Patient continued to gain in weight up to the 58th day, when he weighed 121½ pounds. He then began to fail and died 84 days after treatment began.

Post-mortem examination. Miliary tubercles over the surface of both lungs. Several cavities on the posterior surface of the right. Tubercles scattered throughout left lung.

Left lung, several small cavities with tubercular infiltration of entire lung. Heart and spleen normal. Liver, peri-hepatitis. Intestines, eight small tubercular ulcers. Brain not opened.

(13.) *John Lacy*. Age 45. Admitted Nov. 1, 1890. Treatment began Dec. 19, 1890. Family history negative. Cough began one year ago.

Physical signs. Bronchial breathing and evidences of cavity at right apex. No fever or nightsweats. Weight, 135 pounds. Sputum, no bacilli.

4th day of treatment. Respiration amphoric. Distinct amphoric whisper. Sputum, no bacilli.

6th day. No change.

End of treatment. No change in physical signs or sputum. Weight, 136½ pounds.

Number of injections, 6. Average amount, 0.004 gm.

Under treatment 10 days.

The improvement under lymph treatment was no greater than before.

*Tabulated statement of cases treated.*

| NAME. | Age. | Duration of disease. | Stage of disease. | Gain in weight during treatment. | No. bacilli at beginning. | No. bacilli at end. | Change in cough at end. | Nightsweats at beginning. | Nightsweats at end. | Change in the general condition. | No. weeks under treatment. | No. injections. | Average amount of injections. | REMARKS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mary Davids . . | 22 | 12 mos. | 1st | 8½ | 25–50 | 5–8 | Diminished | Yes | No | Improved | 11 | 55 | .001 gram. | The activity of the process in the lungs increased up to the 11th day. They then diminished slightly to the end of treatment. |
| John Dyer . . . | 30 | 12 " | " | 11½ | 40–50 | 15–20 | Unchang'd | " | " | " | 10 | 47 | .001 " | Active process increased to the 6th day and then diminished. |
| Joseph Quinn . . | 29 | 36 " | " | 14½ | 15–20 | 8–10 | Diminished | " | Occasional | " | 11 | 23 | .005 " | Active process increased to the 4th day and then diminished steadily to the end. |
| Albert Funk . . | 24 | 12 " | " | 7 | 3 | 4–6 | " | " | " | " | 13 | 77 | .001 " | Active process increased for a few days. At end of treatment the lungs in about the same condition as at the beginning. |
| Thomas Temple . | 35 | 6 " | " | 5 | 50 | 100 | " | " | " | " | 10 | 63 | .00075 " | Active process increased slightly to the 12th day and then remained unchanged for 2 weeks, and then diminished. |
| John Owens . . . | 32 | 3 " | " | 4 | 1–2 | 0 | " | " | Yes | " | 11 days | 6 | .003 " | Active process increased. |
| Martin Dowling . | 38 | 6 w'ks | 2d | —5½ | 40–50 | 40–50 | Unchang'd | — | — | Died | 4 | 24 | .0007 " | Active process diminished first and then increased. |
| Edward Atwood . | 33 | 1 mo. | " | 4½ | 3–8 | 8–10 | " | Yes | Less freque't | Improved | 10 | 48 | .001 " | Changes very variable, rales sometimes diminishing and sometimes increasing. Four weeks after treatment evidences of cavity. |
| Maggie Brown . . | 27 | 5 w'ks | 3d | 15¾ | 10–15 | 10–20 | Diminished | " | Yes | " | 13 | 74 | .0005 " | Active processes increased to 3d day. Diminished afterwards. |
| Louisa Emmons . | 40 | 12 mos. | " | 6 | 5–8 | 30–40 | Unchang'd | " | " | " | 8 | 46 | .00075 " | Very little change until 3d week, and then diminished. |
| Geo. Guiles . . . | 19 | 3 " | " | 6 | 5–10 | 5–10 | " | " | No | " | 12 | 60 | .0005 " | Active process increased for five days and then diminished. |
| Christopher Darcy | 47 | 3 " | " | — | 1 | 10–15 | Increased | No | " | Died | 12 | 63 | .001 " | Process increased for a few days and then seemed to diminish a little. On the 70th day increased again. |
| John Lacy . . . | 45 | 12 " | " | 1½ | 0 | 0 | Unchang'd | Yes | " | Slightly improv. | 10 days | 6 | .004 " | Very little change. |

# THE CLIMATE OF SOUTHERN CALIFORNIA IN RELATION TO DISEASE.

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A CORRECT appreciation of the climate of this region is only to be gained after a year's residence at least. As a recent popular writer has remarked, one should stay here the year through and select the days that suit his idea of winter from any of the months. From the fact that the greatest humidity is in the summer and the least in the winter months, he may wear an overcoat in July in a temperature according to the thermometer, which, in January, would render the overcoat unnecessary. For example, the afternoon temperature at San Diego in December, January, February, March was, respectively, 60.5°, 60.9°, 57.7°, 62.4°, and in July it was 63.4°; the maximum temperature for July was 79°, and for January 74°. The greatest difference in temperature occurs at night, but this is more marked in the interior valleys than on the coast, and is shown by the fact that in January Los Angeles shows a register of 46.5°, and San Diego 47.5° at 7 A.M., and at 3 P.M. the figures stand respectively, Los Angeles 65.2°, and San Diego 60.9°. The writer above referred to further remarks that in summer the difference is even greater, as he has observed the thermometer in Los Angeles reach 103° when it was only 79° in San Diego, adding that the weather is unendurable in New York at 89°, while the day heat in California at 103° is not oppressive.

The unusual equability of the coast region with San Diego, as an example, will be apparent from the following statements compiled from the U. S. Signal Service reports for the station at San Diego:—

| | Temperature. Mean. | Max. | Min. |
|---|---|---|---|
| April, 1889 | 67.5° | 83° | 47° |
| May " | 66.9 | 80 | 50 |
| June " | 69.2 | 72 | 56 |
| July " | 73.2 | 84 | 56 |
| August " | 76.7 | 89 | 62 |
| Sept. " | 77.6 | 91 | 54 |
| October " | 65.0 | 80 | 52 |
| Nov. " | 71.6 | 83 | 46 |
| Dec. " | 62.5 | 69 | 40 |
| Jan. 1890 | 51.0 | 66 | 35 |
| Feb. " | 54.4 | 77 | 38 |
| March " | 55.8 | 74 | 41 |

The same official report for 1887, for example, shows the mean temperature at San Diego at 3 P.M. to be as follows: January, 60.9°; February, 57.7°; March, 62.4°; April, 63.3°; May, 66.3°; June, 68.5°; July, 69.6°; August, 69.6°; September, 69.5°; October, 69.6°; November, 64.4°; December, 60.5°. A glance at this table will show that the months of July, August, September, and October presented a three o'clock temperature with hardly an appreciable difference. As I have already remarked, the greatest difference in the temperature occurs at midnight and just before sunrise, hours at which most people, particularly the health-seekers, are not exposed to alternations in temperature.

Let us for a moment consider the all-important question of rainfall, humidity, and relative humidity. The report referred to above, for the same twelve months, shows the following rainfall in inches. April, 0.19; May, 0.03; June, 0.10; July, trace; August, 0.04; September, trace; October, 2.12; November, 0.12; December, 7.71; January, 2.79; February, 1.70; March, 0.31. To quote from the report of the Chairman of the Committee of Medical Topography and Meteorology of the Medical Society of the State of California, Dr. Henry D. Robertson: "That there are cycles of changes occurring with more or less regularity in our meteorological and climatic conditions is recognized by all students on this subject. We will state that for the past decade or perhaps longer, the mean average rainfall for the coast gradually decreased until the beginning of the last rainy season, when a sudden and complete revulsion seems to have taken place, and now we record the greatest rainfall that the coast has experienced since observations have been taken and recorded. Yet, notwithstanding the fact that these observations were taken during a season which presented an unusual rainfall, San Diego presents but 15.11 inches of rainfall in twelve months."

The so-called rainy season in this section usually begins in November—October may have presented a few slight showers—and it lasts until about the middle of April. One must remember, however, that this rain period is not one of continuous downpour, but is pleasantly interspersed with bright, warm days and dazzling sunshine, and above all, that the rain is most liable to fall at night. Here, again, we find it difficult to make a hard and fast statement, as the seasons even in this land of equable climatic conditions are liable to vary greatly in the total rainfall and its distribution. For example, the average yearly rainfall at San Diego is 11 inches, but for the season of 1876 and 1877 the total only reached 3.75 inches, and in the years 1883 and 1884 the unusual rainfall of 25.77 inches was recorded. At Los Angeles, for the same years respectively, the figures stand 5.28 and 38.22.

With these figures one can readily appreciate the fact that there are few days during the winter months on which one cannot be out of doors for at least a portion of the twenty-four hours. As the rains occur while the winds are from the south and discontinue as soon as the prevailing western wind appears, the atmosphere at once clears, and, as there is an entire absence of the enervating, steamy heat of the Atlantic coast, one can immediately resume his out-door life. It is a well-known fact that a thermometrical heat which would be enervating in other localities is stimulating in Southern California. The coast fog, about which so much has been written, is most frequent in this region during the months of April and May. The fog bank usually rolls in about night-fall and disappears a few hours after sunrise. Generally by 9.30 A.M. the coast is entirely free from fog. During these months there may be two or three days on which the fog will be more persistent, and a fine mist may last until 12.30 or 1 P.M., but this only perhaps a half dozen days out of the year. I cannot better conclude this hasty sketch of the climatic conditions of Southern California, with San Diego as an example, than by quoting the words of Charles Dudley Warner: "I do not know whether the San Diego climate would be injured if the hills were covered with forests and the valleys were all in the highest and most luxuriant vegetation. The theory is, that the interaction of the desert and ocean winds will always keep it as it is, whatever man may do. I can only say that, as it is, I doubt if it has its equal the year round for agreeableness and healthfulness in our Union; and it is the testimony of those whose experience of the best Mediterranean climate is more extended and much longer continued than mine, that it is superior to any on that inclosed sea. About this great harbor, whose outer beach has an extent of twenty-five miles, whose inland circuit of mountains must be over fifty miles, there are great variations of temperature, of shelter and exposure, minute subdivisions of climate, whose personal fitness can only be attested by experience. There is a geniality about it for which the thermometer does not account, a charm which it is difficult to explain. Much of the agreeability is due to artificial conditions, but the climate man has not made or marred.

"It is a true marine climate, but a peculiar and dry marine climate, as tonic in its effect as that of Capri, and I believe with fewer harsh days in the winter season."

Within the last two decades the study of physical geography has done much to inform the medical mind of the various climates of the world; but unfortunately exact statistics showing the effect of climate upon the physiological functions of the organism are yet to be formulated; and no less important is it that our knowledge of the effect of climate upon bacterial life is meagre, so much so that at the present day we must confess our ignorance of the scientific knowledge of the healing properties of a given climate in contradistinction to those of another locality; hence it is that so much difference of opinion exists in regard to the relative importance of the different meteorological elements.

*Phthisis.*—Not many years ago the various climatic localities were selected by the clinician depending upon the view which he entertained of the etiology of the disease; but now that a consensus of opinion has been gained in accepting two broad classes of the disease, viz: bacilliary and non-bacilliary phthisis, recognizing, of course, that unhygienic surroundings have much to do with bacilliary invasion, we can approach the subject with more confidence in our ability to solve the problem.

The following classification will, we think, be accepted by most clinicians to-day:—

1st. *Acute Miliary Tuberculosis.*—An acute infectious disease due to an overwhelming number of bacilli, probably entering the blood current and becoming thus widely and rapidly disseminated.

2d. *Disseminated Tuberculosis*—for example, mesenteric phthisis of children, in which there is general infection, but by fewer bacilli, the dose not being immediately overwhelming, but the microbes entering the blood in colonies.

3d. *Tuberculous Pneumonia*—following the inspiration of large numbers of bacilli, or auto-infection by a lung cavity.

It must be remembered that infection by the bacillus may occur in various ways. Kelch, Vaillard (Bull. de la Soc. Méd. des Hôp. de Paris, quoted by Bruen, Med. News, Oct. 1888) have shown that a large number of pleurisies are tubercular in origin, and that the bacilli may enter by the canals or ducts which penetrate a part, or by its blood and lymphatic vessels. From these statements we conclude that infection usually occurs through the alimentary or respiratory systems; and that it may occur through the genito-urinary tract, or by the cutaneous or muco-cutaneous surfaces.

If, then, we desire to select a climate for those predisposed to phthisis, or for the malady itself in the incipient stages, we should in a general way select that locality where we will first and foremost strengthen and stimulate the general physiological structure of the patient, and in this way antagonize or retard the progress of the disease.

It is a well-known and accepted fact that the extent, and, indeed, the character of the lesions in tuberculosis are due first to the numerical strength of the bacilli; and secondly to the manner in which they gain entrance to the tissues. It is also a well-known fact that the climate which will destroy the life of the bacillus is yet to be found.

With this premise let us see the advantages which Southern California offers to the phthisical, or to those predisposed to phthisis.

It must be borne in mind that, as Cullen most aptly remarks, "the air of any place is better for the patient than that in which he grew ill;" and we must also remember that there can be no hard and fast rule for the selection of a climate; but this must be regulated by individual peculiarities. Some will improve or thrive in a warm or hot climate; others in a cool or cold environment; some at sea-level, others at an altitude in rarefied air; but all will probably do best in a dry locality, with a superabundance of sunshine. Variability and equability must be considered in individual cases. The former is of less importance than the latter, which in many cases is to be considered as one of the most important factors.

In Southern California one may find all of these conditions, from the warm equable climate of the coast, where, as we have already shown, the variation of temperature is of the slightest degree possible, and the rainfall is at a minimum, up to an altitude of 12,000 feet, in the San Bernardino Mountains, with the meteorological conditions which we all know are found at this height, down to a basin in the eastern part of San Diego County, 360 feet below the level of the sea.

The county of San Diego presents within its boundaries various altitudes, as seen in the following table, in which a few localities are selected as examples:—

| | |
|---|---|
| City of San Diego | sea level to 225 feet |
| Santa Maria Valley | 1800 " |
| Alpine | 2200 " |
| Cuyamaca District | 4500 to 4700 " |
| Strawberry Valley | 5200 " |
| Tauqwitz Valley | 7500 " |
| Tamarack Valley | 9000 " |
| Mount San Jacinto | 11,100 " |

At an altitude of about 2,500 feet, and on the highest peak, the country is thickly wooded with magnificent specimens of fir, pine, and oak trees; the earth is carpeted with wild flowers as only California can present them in all their grand profusion; the mountain streams remain active throughout the year, and do not turn "bottom side up," as those of lower altitudes during the dry season.

In contradistinction to these mountainous districts, which allow the physician to obtain all the benefits of high altitudes combined with a most desirable climate, San Diego County also presents a most remarkable depression in the earth's surface, known locally as the Conchilla Valley, and geographically as the San Felipe Sink. The invalid may reside at Indio, 20 feet below sea-level, or at Beaumont 2500 feet above sea-level, in close proximity to this basin, and make excursions to "nature's pneumatic cabinet," descending to the lowest point, 360 feet below the sea, in a warm, dry atmosphere, with a very low relative humidity, where good water is supplied by artesian wells, and much of the land is under cultivation with oranges, melons, and other fruits. The locality is much sought by consumptives, asthmatics, and rheumatics.

At 360 feet below the sea the atmospheric pressure is not, of course, so great as in the cabinet; but it must be remembered that a patient receives but two or three *séances* a week, whereas in this valley he is constantly subjected to a moderately compressed air day and night, if he selects Salton as his residence.

Smith,[1] in referring to the beneficial effects of the increased oxygen inhaled, says that compressed air is useful in catarrh of the mucous membrane; in acute and subacute inflammation of the respiratory mucous membrane; in restoring the permeability of air-tubes occluded by exudation or otherwise; in asthma, in pulmonary hemorrhage, in pleuritic effusion, in simple anæmia, in inveterate cases of psoriasis and ichthyosis, and in the various forms and stages of phthisis.

We now know that extreme elevations do not present immunity from phthisis. The high localities of Ertz and Reisengebirge in Saxony present a large percentage of phthisical affections in contradistinction to the Sandwich Islands, which previous to 1778 were almost exempt from the disease; but now in this century the race is almost disseminated—a further illustration of the universal presence of the bacillus tuberculosis from sea-level to mountain peak.

[1] The Physiological, Pathological, and Therapeutic Effects of Compressed Air, quoted by Lindley. N. Y. Med. Record and South. Cal. Practitioner.

In California of the South, owing to the peculiar topography and the enormous size of the State, we are able to surround our patient with many and varied climatic conditions within a few hours. At the coast he may be subject to the beneficial effects of sea air, which is so marked in the catarrhal processes of phthisis, or of subacute or chronic bronchitis. Furthermore, an ocean climate assures him of great purity of atmosphere with an abundance of ozone, conditions which are most soothing to an overwrought nervous system. If he can obtain these conditions without the soil dampness so prevalent on the Atlantic coast, and so conspicuous by its absence on the lower coast of Alta California, he will in many cases be situated in an environment which will retard the progress of his disease primarily by its effect upon his general condition, and allow him to derive all the benefit referred to. Experience has taught me that non-tubercular cases will do best under this plan of life, but that the other forms of pulmonary disease do best between sea-level and 700 or 800 feet elevation. In support of these statements I will cite several cases from my note-book that have been under my observation for periods varying from one year to two and a half years.

CASE 1.—A. B. æt. 37, ordered west by Dr. Loomis, of New York, came under my observation two and a half years ago, with dense consolidation of left upper lobe, flattened chest, and marked subacute laryngitis, weight 134, height 5 feet 11 and a half inches, nightsweats, cough, diarrhœa. *Status praesens:* weight 158, no laryngitis, left upper lobe consolidated, but to a less extent, no rales, no expectoration, no nightsweats, lives in the open air, rides daily, cultivates personally five acres of land, no bacilli.

CASE 2.—Mrs. C. D., diagnosis of phthisis made by Drs. Carrol, Morgan, and Bliss, of Washington, D. C., came under my observation one year ago, after living three years in Southern California. The note at that time reads: Deficient expansion both apices, most marked on left side, auscultation, bronchial breathing and bronchophony pronounced over left anterior apex from clavicle to third rib; right apex anteriorly, deficient expansion, slight bronchial respiratory murmur, posteriorly same side; just above spine of scapula a distinct but small vomica is situated, percussion resonance impaired over area under consideration, no rales, no expectoration. Diagnosis, fibroid phthisis; *stat. praesens*, no material change; have advised a three months' residence at an altitude of 1500 feet, to assist expansion; no bacilli.

CASE 3.—Mr. E. F. was under the care of David L. Huntingdon, Major and Surgeon U. S. Army, for the past eight months, and was turned over to me when that officer was ordered to St. Augustine. I am informed by Dr. Huntingdon that during these months no retrogression occurred, and I find the lungs upon examination to present the same physical signs as described by the patient's physicians in the East one year ago. Has had several slight hemorrhages, so have sent him to the interior at an elevation of 2200 feet. Bacilli have been present in small numbers for several months.

CASE 4.—G. H., æt. 45, admitted to the San Diego County Hospital a number of times, and through the kindness of Dr. J. P. Lefevre, I have had the opportunity of watching the case. The patient was first admitted to hospital several years ago. He remains a few months, goes out on liberty, and usually returns to hospital after a protracted debauch. Notwithstanding, his lungs have remained about in the condition recorded at first admittance, that is, marked consolidation of right upper lobe, no rales, no expectoration, fibroid change. The longer my residence in this locality the more forcible and apt seems the remark of Bruen (Medical News, Oct. 13, 1888): the consideration of the etiology of phthisis would indicate that climate is of value to the individual predisposed to phthisis, not by a single or specific quality of the air, or by any definite combination of meteorological conditions, but by pure air uncontaminated by miasm, organic or inorganic substances. The chief purpose of climate change is to increase cellular resistive power.

In a series of statistics compiled by Bullard (Trans. Medical Society, State of California, 1890), it is shown that the percentage of phthisis to other diseases among the native population is only $4\frac{4}{10}$ per cent., whereas in the foreign population, that is those from other States, it is $43\frac{1}{2}$ per cent. 47 per cent. of those admitted to hospitals in Southern California have been in the State less than one year.

*Pneumonia.*—The writer, after a residence of nearly three years in this country, has seen but three cases of pneumonia, and all in consultation practice, one of which must be excluded from consideration at the present time. This case occurred in the practice of Dr. Bowditch Morton, and was seen by me in the second week of the disease. I was informed that the patient, a large plethoric woman, had entered "a cold storage-room" while in a perspiration from walking. Certainly we cannot class this case among those studied from the standpoint of locality. Recovery occurred within the usual time.

The other case occurred in a young man of 22 years, as a sequela of the grippe, and was fatal in five days. The third case was a frank croupous pneumonia, in the person of a stout, thickset man 64 years of age. I was called to consult with D. L. Huntingdon, Major and Surgeon U. S. Army, on the second day of the disease; the patient died within the week of heart-clot. This pneumonia was of a nature similar to the pneumonia observed in the East, and differs in no way from the writer's experience of the disease in Philadelphia.

A recent writer, Remondino, in the Southern California Practitioner, says that he has seen but two cases of pneumonia in 16 years—both the result of chill while perspiring. In Los Angeles County, in a total of 664 deaths, pneumonia appears as the cause but in 2.41 per cent. of this total. The report of the Health Department of the city of San Diego from July to December, 1888, inclusive, shows but 12 deaths from pneumonia: three occurred in November, and five in December.

The writer has not met with any cases of pleurisy, asthma, or bronchitis in the native population. All the cases of these maladies which have been observed have occurred in those who have sought this State in order to restore their health, and have either suffered from one of these diseases in their homes, or have developed them owing to their weakened condition from prolonged illness.

Baker, in a paper before the Ninth International Medical Congress (quoted by Rohé), has shown in a convincing manner by diagrams and tables that the rise and fall of sickness from pneumonia, bronchitis, influenza, tonsillitis, croup, diphtheria, and scarlet fever, are more or less controlled by the fluctuations of atmospheric temperature, the diseases being increased by a lower, and diminished by a higher, temperature.

*Kidney Affections.*—It is in renal disorders that the country under consideration presents an almost unique record. This is well illustrated in a case of chronic interstitial nephritis which was under my care for nearly two years, the latter part of which was spent in my private hospital, thus allowing an almost constant record of the disease. The patient, aged 55, contracted renal disease from exposure during the war. In 1884, he came to California with the following urinary record, made by Tyson, of Philadelphia, on December 6th, 1884: "Sp. gr. 1010; color, yellow; reaction, neutral; quantity and character of sediment, trifling, heavy; abnormal constituents in solution; albumen about $\frac{1}{40}$th the bulk of urine tested. Sediment. A moderate number of hyaline casts; numerous crystals of the triple phosphates."

As far as it is possible to judge there was probably here a contracted kidney. The patient, himself a physician, was in a position to gain all the benefit from a mild equable climate, and after much change and a careful study of the various localities in Southern California, settled upon San Diego as presenting, at least for him, the most acceptable environment. The urinary secretion remained about as indicated in the above report. The man was able to pursue a fairly active life; the skin assumed an excretory function which was very remarkable; and in view of the post-mortem examination it seemed probable that life was prolonged and the equilibrium maintained solely through this supplementary action of the cutaneous surfaces. Eleven days before death urea was excreted by the skin to such an extent that, as crystallization occurred, the patient presented the appearance of one in a snowstorm. The hair and beard were matted with this incrustation, and the entire skin was covered to such an extent that after death the attendants, with a piece of stiff card-paper, scraped off an ounce of these crystals in a very few moments. The kidneys weighed but two and a quarter and three ounces respectively. They were practically devoid of excretory power, and were much more advanced in disease than I have ever before noted them in a somewhat extended experience at the post-mortem table. It appears, then, that a residence in a suitable locality, while it will not of course arrest well-marked kidney lesions, will at least prolong life to a degree far beyond the natural expectancy, and present us with specimens which are in themselves proof of this prolongation of life by the advanced state of the lesions. The constant skin activity, much of which is manifested as insensible perspiration, lowers arterial tension and depletes in a most beneficial manner, relieving the overtaxed renal circulation and the diseased parenchyma. Furthermore, the patient will be protected from the dangers of intercurrent or concomitant maladies which are so apt to prove fatal to one with renal inadequacy.

Space forbids a further consideration of this subject. But the future will show that in Southern California, from sea level to 2000 feet, the physician has at his command the climatic conditions which will prolong the life of those suffering from chronic renal disorders; and if the change is made soon enough, when the connective tissue is yet embryonic, it is but reasonable to suppose that, with decreased tension, an active skin, freedom from intercurrent renal congestions, and a constant outdoor life, the diseases may be arrested or removed.

J. C. Wilson and Loomis (Transactions of the American Climatological Association, 1889) consider that there is reason to believe that low temperature, rapid change of temperature, and high altitudes are unfavorable elements, whereas equability and warmth are favorable influences.

*Rheumatism.*—The rheumatic will find in a properly selected locality in this country, which presents so many minute subdivisions of climatic factors, almost entire immunity from his affection. It is a mistaken conception to consider the coast strip, from Monterey to San Diego, as inimical to the rheumatic's welfare.

It cannot be considered that rheumatic maladies, which arise in Southern California among the native population or those long resident here, are the result of any climatic conditions. The specific originating cause of rheumatism is not by any means removed from the arena of controversy. A review of current medical literature will speedily convince one that we are far from a consensus of opinion on this subject; and it is but fair to suppose that our climate presents nothing in itself which will retard the operation of this cause within the individual any more than, as we have already remarked, the climate has yet been discovered that will kill the bacillus tuberculosis. Those who, in addition to the ordinary manifestations of rheumatism, present a peculiar susceptibility to changes in the weather, either to extreme heat or cold dampness; those who, like the well-known West Point professor, are slaves to the clouds; or those cases which are neuralgic in nature, with or without a rheumatic taint, such as have been recently so ably studied by Cantling, a perusal of whose experience will well repay the time spent, under the title of "The Relationship of Atmospheric Electricity, Magnetic Storms, and Weather Elements to a Case of Neuralgia," in the Medical News, May 2, 1891, will find almost entire immunity from their tortures somewhere in Southern California. The exact location they must decide for themselves by personal experience.

At present I have under my care a severe and long-continued case of neuralgia that does well in the Santa Maria Valley, 1500 feet above the sea, where the temperature is apt to be in the nineties.

One should endeavor to avoid a location which presents great diurnal temperature range, or in which there is great difference between midday and midnight thermometrical records.

*Erysipelas.*—In an air that is so free from germs that meat may be hung exposed to the dry winds almost indefinitely—a process of desiccation always occurring, putrefaction never arising—it is but reasonable to suppose that Fehleisen's coccus (Meerovitch streptococcus of erysipelas), whose etiological relation to the disease is demonstrated beyond question, is, if present at all, surrounded by an environment which is inimical to its virulence. Certain it is that erysipelas is among the more rare diseases that we meet in our practice. Bullard's statistics show but one death in eleven years, and demonstrates the fact that in all Southern California erysipelas is only about half as frequent as in the rest of the United States. Two years and a half in active hospital practice in Southern California has failed to bring forth a single case.

*The Climatology of Old Age.*—Advancing years may be robbed of many concomitant infirmities by residence in a suitable locality. The aged are rarely safe in a high altitude; nor can they with impunity change their station from low to high altitudes, more particularly should they suffer from chronic pulmonary disease, bronchitis, bronchiectasis, fibroid phthisis, or the like. A dilated, fatty heart is an absolute contraindication to removal from sea level. On the whole, a marine climate is preferable for the aged, and if it is warm and equable, so much the better, as gout and rheumatism may be warded off, or, if present, the severity of their manifestations may be lessened.

Cystitis, so often an attendant of advanced years and so apt to be aggravated by damp, changeable weather, will be markedly benefited by our warm, equable climate.

Insomnia, the plague of the old, and sometimes the torture of the young, will find most speedy relief at the coast. Indeed, the writer has observed most gratifying results in this respect after a sojourn of even a few months.

Dutton, whose conclusions I most fully indorse, in the Boston Medical and Surgical Journal, May 10, 1889, answers the question: What class of patients should be sent to Southern California? as follows:—

"Those who are so enfeebled as to suffer from the severities of a northern winter; the overworked and those needing rest; the prematurely old; the rheumatic; the sufferer from incipient phthisis; the victim of bronchial troubles; the dyspeptic; and, in fact, all generally enfeebled people."

In conclusion, I must state that a careful review of the literature pertaining to Southern California as a health resort convinces me that much of it has been written either by those who have never been in the State or who have made their observations as tourists from the windows of a rapidly moving train. To repeat, a correct appreciation of the climate of this region is only to be gained after a year's residence at least. Personally, I have refrained from expressing my views on this matter until the present time, after a residence of nearly three years.

1855 Fourth St., San Diego, Cal.

# THE VASO-MOTOR PARALYSIS IN INFLUENZA.[1]

BY JNO. B. ELLIOTT, M.D.,
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I TAKE the liberty to deviate from the usual formal report upon general medicine and to devote my attention to certain phenomena of the late epidemic of influenza, believing that by so doing I shall the better fix your attention and excite your interest.

The various vaso-motor paralyses observed last winter in the epidemic of influenza in New Orleans seem worthy of more attention than has been bestowed upon them in our medical literature.

Your reporter first observed the condition of vaso-motor paralysis of the lung early in the epidemic, and all subsequent cases were examined closely in order to test the observations made in the first case.

The first case is recorded as follows: Patient, a boy 13 years of age. Was summoned to prescribe for him on December 3, 1890. Found him with a bad bronchial cough. Temperature 100°. Pains in head and limbs. Prescribed an alkaline cough mixture. Was summoned five days later to see him again. Found temperature 102.5°. Respiration 26. Cough troublesome and painful. Sputa scanty; no blood in sputa.

Examined both lungs carefully. Found left lung clear upon percussion. Respiration exaggerated. No rales. Right lung dull upon percussion. Air entering the lung upon deep inspiration, but lacking the vesicular element, sounding as if it was confined to the tubes, although there was no bronchial breathing. There were no rales. Vocal resonance slightly above normal.

My attention was immediately fixed by the peculiar condition of the lung, for the following reasons:—

[1] Read before the Louisiana State Medical Society, May 15, 1891.

(*a*) If it was a congestion precedent to the solidification of pneumonia, then I was likely to have a very extensive amount of lung involved, and so a very serious case.

(*b*) I had never seen any such general congestion precede an attack of pneumonia.

(*c*) The total absence of rales, either crepitant or subcrepitant, was peculiar and unusual.

(*d*) The number of respirations per minute (26) did not seem to indicate very much loss of breathing space.

(*e*) The patient did not impress me as being seriously ill.

When seen the following day the patient appeared pretty bright, and not much incommoded by his condition. The lung was carefully examined again, and no change was found. There was still about the same amount of dullness; the same dry respiration; the same absence of rales, and only some slight increase of vocal resonance. Very little sputum, and no blood.

At this visit the lung lacked all the characteristic signs of pneumonia, and yet there had been plenty of time for their supervention. There was no bronchial breathing, no bronchophony, no subcrepitate rales, no bloody sputum, no such pain as indicates inflammatory processes in lung or pleura. I could tell the parents only that I found the lung congested, as it had been the day before, but that the child did not have pneumonia.

The next day I went to see the case with some curiosity, for, if it was still to develop into a genuine case of pneumonia, I recognized that I had found a unique phenomenon in the long-continued state of passive congestion preceding it.

I found the patient more easy and comfortable. The cough was loose and the expectoration free; no blood. Temperature 101°. Respiration 26. Upon examination the lung was still dull, but auscultation showed the lung to be filled with large loose mucous rales.

These rales, following upon the state of dry passive congestion of the preceding days, made me realize that I was dealing with a new condition, and stimulated my subsequent observation for similar conditions. I became thoroughly familiar with it during the following month, and fell into the habit of calling it the *grip-lung*.

This *grip-lung* is the type of the vaso-motor paralysis to which I desire to draw attention; for afterwards, in the course of the epidemic, I could recognize the same condition in other apparatuses and organs.

My interpretation of the above case was made certain by continued observations upon similar cases through the succeeding weeks. My final conclusions were as follows:—

1. The influenza is a disease which affects primarily the nervous system. The initial attack is usually simple, lasting but three or four days, yet producing a nervous prostration out of all proportion to the mildness of the attack.

2. A very large proportion of cases relapse, and in these relapses occur the phenomena of vaso-motor paralysis of which I am speaking.

3. These vaso-motor paralyses seemed to be local phenomena, sometimes introduced by evidences of general vaso-motor paralysis (slight chill).

4. In the large majority of the cases observed this vaso-motor paralysis occurred in the *right lung;* in a few it occurred in the *left lung.* In three cases it occurred in the meninges of the brain. In two cases apparently in the liver. In one case in the kidney. In one case in the spinal cord. In many cases intermittent heart-beat showed interference with the nervous mechanism of the heart.

1. Taking up these postulates in the order of their statement: I think no argument need be made upon the first. As far as my inquiries extended among my brother practitioners, they all seemed equally impressed by the mildness of the primary attack and the disproportionate nervous prostration. In one of my own cases, the patient, a middle-aged female, was confined to bed for a week, and yet the temperature never rose above 99.5°. Nervous prostration was literally the only symptom in the attack. This nervous prostration was always notable in the simplest case, and according to my observation lasted from forty-eight to seventy-two hours, after the temperature had returned to normal.

2. The relapsing cases were usually accompanied by vasomotor paralysis somewhere in the body, and every relapsed case was serious. These relapses occurred during the period of ner-

vous prostration following the primary attack, usually within seventy-two hours. They were determined by any extra call upon the nervous system for work, such as:—

Any undue physical exertion.
Any undue effort at digestion, a heavy meal.
Any excitement, mental labor, or nervous shock.

They were frequently introduced by a general chilliness, but seldom by a rigor, and this sensation of chilliness frequently recurred throughout the relapse.

3. These vaso-motor paralyses seemed to be local phenomena. Under this head falls what I desire to say concerning the *grip-lung*. In the typical case given the following facts seem to me to be conclusive as to the pathological state being one of vaso-motor paralysis with passive blood stasis.

(*a*) The dullness over the right lung as compared with the left lung was plain even to a layman. The percussion was performed upon the surface of the body without intervening covering, and was comparative—each portion of the right lung being contrasted with the corresponding portion of the left.

(*b*) The dullness was *not pleural*, for there was absence of pleural pain, and the vocal resonance, instead of being remote (pleural), was slightly increased (lung).

(*c*) There was no exudation at first, for there was an absence of rales, an absence of bronchial breathing, and an absence of bronchophony.

(*d*) This total absence of exudates proves the condition to be one of passive blood stasis, and not one of active (inflammatory) congestion. That this condition was one of passive blood stasis seems to be further proved by the fact that it was entirely indefinite and undetermined in its continuance. My own observations taught me this important fact, that the younger the patient the shorter the existence of the condition. In the case cited in this paper the blood stasis terminated upon the third day. In other cases I have recognized it in patients at the end of three weeks, and in one case there was still evidence of it at the end of three months.

The method of resolution also supports the conclusion contended for. When resolution occurred early, large mucous rales appeared at once, as if there had been a free and sudden effusion into the tuber, and not the gradual breaking down of a semi-solid exudate.

4. The fact that the blood stasis occurred chiefly in the right lung fixed my attention early in the epidemic. Out of twenty-five cases of *grip-lung* twenty-two occurred in the right lung, and three only in the left. Of these three, one had tubercle at the left apex, one had chronic parenchymatous nephritis, and both lungs were involved, and the third had suffered from asthma for some years and both lungs were involved. It appeared as if some pre-existing defect in the left lung was necessary to produce the condition there. If this curious predilection for the right lung was as commonly noted by other observers as by myself, it is worthy of record.

In the cases of *grip-lung* another fact was observed which may explain why so many cases of pneumonia were recorded. I observed that where the blood stasis continued for a week or more a slow exudation seemed to occur; that dullness slowly increased; and that vocal resonance became more and more pronounced. In such cases, however, the condition differed essentially from pneumonia in its method of clearing up. There was no sudden resolution with subcrepitant rales and defervescence, but a gradual and slow restoration of the lung to its normal condition. Furthermore, I have been consulted by patients from the country who had passed through an attack of the influenza, and who consulted me because they had not regained their health. In two such cases no reference was made by the patients to any trouble with the lung. There was no pain, no cough. The respirations were, however, in one case 26, in the other 24 per minute. Examination showed dullness over the right lung, with dry respiration and some slight increase of vocal resonance. Both patients still had partially unresolved *grip-lung*. These conditions disappeared gradually in two or three weeks. From my observations throughout the epidemic such cases begin with a passive blood statis in the lung, such as I have described, but without the active congestion and exudation characteristic of acute pneumonia. Where resolution does not take place suddenly by free liquid secretion, and the large mucous rales described in the case cited, a slow, gradual exudation takes place accompanied by a gradually increasing vocal resonance; but I have never seen it reach the typical bronchophony of the second stage of pneumonia, nor have I ever observed the marked bronchial breathing of the same disease.

The essential differences, then, between acute pneumonia and the *grip-lung* would be as follows:—

The pneumonic lung has a very brief period of active congestion, followed by rapid exudation and consolidation, giving crepitant and then subcrepitant rales with bronchophony and bronchial breathing usually within forty-eight hours, frequently much sooner.

The *grip-lung* has a long and very varying condition of passive blood stasis unaccompanied by rales. If resolution occurs within three or four days, it is accompanied by large mucous rales, and no time is given for the slow appearance of bronchial breathing or bronchophony; but, during the long continuance of the blood stasis, an exudation occurs, increasing slowly, which will give in time some bronchophony and bronchial breathing, but never so complete as in pneumonia. Resolution never occurs in these cases with the suddenness that characterizes it in acute pneumonia. The condition passes off as gradually as it formed. The sharp, clear cut, and sudden phases of the pneumonic attack separate it clearly from the obscure, irregular, and slow phases of the *grip-lung*.

That other organs suffered from the same vaso-motor paralysis and passive blood stasis seemed to the writer unquestionable. Two cases affected with *grip-lung* had head symptoms, which in both cases entirely obscured, for a time, the condition of the lung. These symptoms were sleeplessness and active delirium, lasting from five to seven days. During the existence of this sleeplessness and delirium, the blood stasis in the lung appeared, attention being drawn to the lung by a slight increase in respiratory movement, not by any complaint from the patient. The condition of the lung was in both cases secondary to the brain hyperæmia. In both cases in which this hyperæmia of the brain existed, it passed off in from five to seven days, leaving no evidence of permanent local effect. A third case was seen, but could not be followed up. One case was observed where slight tetanic symptoms, rather unique and transient in their character, pointed to the spinal cord as the seat of a hyperæmia.

In two cases which have ~~fallen under~~ my observation since the epidemic, there are all the symptoms of a chronic, local, spinal hyperæmia, due to attacks of ~~influenza~~. In these cases a long-continued passive hyperæmia has probably resulted in some local connective-tissue hyperplasia and sclerosis.

Two cases of hyperæmia of the liver in influenza were active rather than passive. The attacks were preceded by the usual mild symptoms of the primary attack of influenza. When seen the liver was enlarged and painful to the touch. One of these cases lasted but twelve hours, the other forty-eight. These cases, involving the liver, have cast some light for me upon two cases of chronic affection of the liver seen since the passing away of the epidemic. These two latter cases date their liver affections from attacks of the influenza. In both cases the dimensions of the liver in the mammary and axillary regions are a full inch less in vertical dullness than normal. A partial sclerosis seems to have occurred diminishing the bulk of the organ. Both patients have very notably lost in weight, yet are without the patent evidences of obstructed blood flow through the liver, namely, ascites, and distention of the superficial abdominal veins.

During the epidemic one case was seen in which the symptoms pointed to a passive hyperæmia of the kidney. A second case, seen since the epidemic, but dating from an attack of influenza, gives albumen in the urine with hyaline casts. This case has yielded to simple treatment in a way that leads to the belief that these symptoms were the result of a *grip-kidney*. No true interstitial nephritis has ever so responded to treatment in my experience.

The cases in which the heart suffers seemed to depend upon disturbance of the nervous ganglia controlling the heart's rhythm. Intermittence of the heart's beat has been the commonest symptoms noted. One case of intermittent heart beat was observed in a child eleven years of age. Several cases have been observed in the young adult. In the aged, where it is a more or less common phenomenon, evidence of its "grip" origin could not be relied upon.

The explanation of these local vaso-motor paralyses has yet to be worked out. The facts seem to be that the influenza causes a general depression of the nervous system; that with this general depression the vaso-motor apparatus sympathizes (general feeling of chilliness); that the chief vaso-motor centre in the medulla rallies quickly from the depression, but that the peripheral vaso-motor ganglia in the different organs fail to regain their tone, leaving the arterioles relaxed and the capillaries engorged. These local failures of the vaso-motor apparatus are probably determined by pre-existing feebleness in the nervous mechanism of the organ. These local blood stases are totally without definite time limit as to their continuance, the age of the patient being the only factor that seemed to be in any way connected with their duration. The younger the patient the more brief the paralysis.

The results of these hyperæmias will probably engage the attention of the profession for many months to come. Passive hyperæmias are conditions of sluggish circulation, and present us with the anomalous fact that with an existing anatomical hyperæmia we have a lack of proper pabulum (blood slowly renewed), or, truly speaking, a physiological anæmia. In the presence of such a blood stasis the low grade tissue (connective, skeleton tissue) flourishes. The pabulum which is unfit for the development of a high grade parenchymatous cell (nerve-cell, liver-cell) will always freely support the connective-tissue cell, and so connective-tissue hyperplasia with consequent contraction and sclerosis is to be expected. Connective-tissue hyperplasiæ are likely to be not uncommon during the coming months as relics of the influenza. To establish such an origin would, however, give me grounds for a more hopeful prognosis than is usually afforded in connective-tissue hyperplasia.

Concerning the treatment of the influenza and these subsequent vaso-motor paralyses, some other occasion must offer for its discussion. Only the general statement can here be made, that early in the epidemic it became patent that depleting remedies prolonged the attacks, and stimulating treatment seemed to shorten them. In entering upon another epidemic I would do everything to conserve the strength of a patient in the first attack, believing that I would so most likely save him from a relapse and its consequences. I believe I saved many patients from the usual relapse by keeping them *in bed upon a strict* dietary for forty-eight hours after the fever of the first attack had disappeared.

# CHOREA IN RELATION TO CLIMATE, ESPECIALLY THE CLIMATE OF COLORADO.

By J. T. ESKRIDGE, M.D.,
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THE greatest diversity of opinion exists, even among the physicians of Colorado, concerning the frequency, severity, duration, and curability of chorea at the various altitudes of this State in comparison with the frequency and course of the disease at lower altitudes, especially in warm and damp climates. That much unwarranted prejudice prevails among some physicians against trying to treat chorea in Colorado is shown by the fact that after choreic patients have been ordered to a lower altitude by their physicians they have sought other medical advice and been cured of the attack in a comparatively short time without leaving their homes.

In 1887 the writer endeavored to ascertain the views of a number of physicians, practising at various altitudes in Colorado, concerning the influence of the climate of Colorado on chorea and other diseases of the nervous system (The Journal of Nervous and Mental Disease, vol. xiv., September–October, 1887). With reference to chorea, Dr. Anderson, of Colorado Springs, elevation 6000 feet, stated quite emphatically that all cases of chorea which he had seen in Colorado were aggravated by the altitude, and his treatment consisted in removal to sea-level. Dr. Strickler, of the same place, thought he had seen a rather large proportion of choreic troubles, and many of them proved rebellious to treatment, necessitating removal to a lower altitude, which was usually attended by benefit. On the other hand, Dr. McDonald, of Pueblo, elevation 4400 feet, knew of no points of difference in cases of chorea, neither in their course, prognosis, nor treatment, between cases in Pueblo and New York.

Dr. Sears, of Leadville, elevation 10,200 feet, expressed the opinion that the altitude there increased the frequency and severity of chorea. He had never seen a case that did not ultimately recover when it was impracticable for the patient to leave home, but it seemed to be his custom, whenever possible, to send his choreic patients to a lower altitude, an experiment usually followed by relief. In his communication to me he took particular pains to state that some of the relief he attributed to change of scene, mode of life, and difference in temperature. He, like the other physicians who kindly gave me the results of their experiences with chorea in Colorado, failed to state the duration of the disease in this climate.

Dr. Edmundson, now of Denver, informs me that when he resided in the mountains of Colorado, at an elevation of about 8000 feet, he found chorea more frequent and severe, with a greater tendency to resist treatment and to return from trivial causes after the disease had been once checked than was his experience with the disease at sea-level. He also thinks the disease more frequent in Denver than he found it before coming to Colorado. I find quite a number of physicians of Denver who believe that chorea is unfavorably influenced by the climate here. On the other hand, numerous physicians of Denver tell me that they have been unable to observe any difference in the frequency and manifestations of the disease here and at sea-level. Excluding one or two cases of hereditary chorea in the adult observed in Denver, I have been unable to find a physician who has seen a case of the disease that has failed to yield here to systematic treatment if continued sufficiently long. As much prejudice exists against allowing choreic patients to remain in Colorado until the arsenical treatment has had a thorough trial, wrong conclusions are often reached because these patients have recovered within a few weeks after going to a lower altitude, the treatment begun in Colorado in the meantime being continued. Many physicians here seem to lose sight of the fact that chorea in low altitudes often extends over periods of several weeks, and sometimes months, although the most vigorous anti-choreic measures known are resorted to. It is a common experience to have recurrent attacks of chorea at sea-level. If I can get answers to a number of questions that I am having printed to send to physicians of the Rocky Mountain region, concerning many points connected with the clinical history of chorea, I hope in the near future to be able to arrive at some definite conclusions concerning the influence of altitude on this disease. Chorea, in a minority of instances, is probably associated with or caused by organic changes in the central nervous system, whilst in a large per cent. of the cases the cause is a functional disturbance of the nerve-centres, induced by fright or any other exciting cause, which may temporarily disarrange the centres from which issue the nerve influence that controls muscular action; or the lower nerve-centres through which impressions or motor impulses pass may be affected and choreic movements result. Of the purely functional type of chorea I have recently had under my care two cases, the cause in each instance being a fright by a large dog. Both cases yielded to the usual anti-choreic treatment in about three weeks. It is probable that we can better understand the influence of Colorado climate on chorea if we take into consideration in the study of our cases here the cause of the disease. I am inclined to believe that the cases of chorea that follow immediately, or soon, after an attack of rheumatism are probably of an organic nature; the lesion may be plugging of the nutrient arteries of nerve-centres. Such cases would probably only be influenced by climate in so far as the climate might modify the rheumatic diathesis. It is well known that "a change" in subacute and chronic rheumatism is often followed by good results. The writer's experience, whilst practising in Philadelphia, taught him to send such cases to the seashore or to the country, an experiment usually followed by benefit to his patients as their general health began to improve. It may be that many cases of chorea that are sent away from Colorado are of a rheumatic nature, and the improvement is the result of the improved nutrition effected by the change, climate *per se* having little or nothing to do with it.

Dr. Dodge, of Boulder, Colorado, elevation about 5400 feet, gave me, a few days ago, the history of a case of chorea which occurred during an attack of rheumatism. The patient was twenty-four years old, female. She had a severe attack of rheumatism, affecting the joints, during which headache was bitterly complained of. For the relief of the latter large doses of antipyrine were used. The chorea came on during the free use of antipyrine, and the choreic movements did not seem to be much influenced by it. Finally chloral was tried in heroic doses with but indifferent success. At the end of several weeks the patient was removed to lower altitude and the chloral continued for a week or ten days, when the movements began to lessen, after which all treatment was discontinued. The patient finally made a complete recovery, but in what time the doctor was unable to inform me. With our present limited knowledge of the influence of Colorado climate on chorea we are unable to say in this instance whether the beneficial influence experienced on going to a lower altitude was due to a modifying influence on the chorea or to an improvement of the rheumatic diathesis and removal of the ravages of the disease on the nerve-centres consequent upon improved nutrition. If it is found that cases of chorea caused by fright alone, and disconnected from rheumatism as a modifying factor, run a shorter course, are severer and more yielding to treatment at low altitudes than in Colorado, it will be quite positive that our climate has an unfavorable influence on the disease. Before such definite information is obtainable the disease must be more carefully and systematically studied here by a number of competent observers, who are unbiased by prejudice.

The subject is far from being an unimportant one. Colorado is deservedly a favorite resort for consumptives. One member of a family may be the subject of tuberculosis and another may be choreic. It is often desirable when one member of the family must come to Colorado for the entire family to take up their residence here. If it can be shown that persons who have suffered from attacks of chorea are not made more liable to a recurrence of the disease by coming to Colorado; that nervous persons are not more subject to chorea here than they would be at sea-level, and that the disease is as mild, as short in duration, and as yielding to treatment here as at low altitudes, much prejudice against the climate for this class of patients will be removed. It may not be demonstrated that chorea is entirely uninfluenced by the climate of Colorado—I think it is modified to a greater or less extent by the climate; but, while certain conditions of the atmosphere undoubtedly do increase functional nervous troubles, there are counteracting features which are bracing in character. Besides, open-air life in Colorado, even for children, is much more enjoyable in spring and winter than along the Atlantic coast, the time of year when chorea is most prevalent East, and this has a tendency favorably to modify the course and duration of the disease.

I have observed over and over again, and often taken advantage of it in the treatment of my cases, that nervous affections which seem to be due to an irritable or unstable condition of the nerve-centres are favorably influenced by a change from a higher to a lower altitude or from a lower to a higher altitude, provided in the latter instance proper precautions are taken to prevent the patient exercising soon after coming to the various elevations of Colorado, a precaution that all invalids coming to this climate should observe. It is a common experience with persons suffering from megrim East to come to Colorado and be comparatively free from the disease for several months, when the attacks may gradually increase in severity and frequency until they have reached or exceeded their former intensity, and then on removal to a low altitude another period of several months' comparative freedom from headaches occurs. The modifying influence of the simple change of climate in the study of chorea must be borne in mind when endeavoring to estimate the effects of Colorado climate on the disease. The case of chronic chorea referred to in my article in 1887 (Ibid.), in which the altitude at Colorado Springs, elevation 6000 feet, seemed to aggravate the trouble, had certain exciting influences other than climatal. The patient was a boy, about thirteen years old, with paranoiac tendencies, nervous and excitable and choreic to a greater or less degree almost constantly from the date of an injury to the head received in early childhood. He came to Colorado to visit a very sick, consumptive mother whom he had not seen for several months. After several hours of very excited conversation with his mother he retired to bed and soon fell asleep, but during the night he became maniacal for several hours to a greater degree than he had ever shown while East. These attacks, although less severe, were said to be common at his home in New York City after he had been greatly fatigued or excited from any cause. After the maniacal period he exhibited exaggerated choreic movements beyond what was his wont at home. During his week's stay in Colorado he improved somewhat, although allowed to exercise considerably, but the choreic movements were greater and less easily controlled by medicines than had been found East. On his leaving Colorado he began to improve, and by the time he reached New York only slight and occasional choreic movements were noticeable. His visit to Colorado was followed by a period of comparative freedom from his trouble. Another case of chronic chorea is mentioned in the same article: "The boy, about thirteen years old, was attacked some time before he went to Colorado, more than two years ago. His mother, who is exceedingly nervous and subject to severe 'sick headaches,' says that he has not been any worse since going to Colorado, but on the contrary she thinks a little better. The boy's life in the West has been, for the most part, spent in the open air and on horseback much of the time, a mode of life usually attended by amelioration or cure of chorea East."

In concluding the paragraph on chorea in my article written in 1887 at Colorado Springs (Ibid.), I stated that "I have observed and treated a number of cases of the disease in Colorado. It has not been my experience to find the muscular twitching worse, but the disease has been of longer duration and less influenced by treatment than I had found it in Philadelphia. When I take into consideration the open-air life, the exercise, both afoot and on horseback, indulged in by children in Colorado, and compare this with life in large cities, with their close, overcrowded school-rooms, ill-ventilated homes, narrow, filthy streets, and yet find that chorea is more rebellious to treatment and of longer duration in the former locality than in the latter, I am forced to the conclusion that the climate of Colorado acts unfavorably on such affections of the nervous system. Colorado is too young, and the difference between life in the East and far West is too great for us to determine the relative frequency and severity of chorea in the latter; nevertheless, I cannot refrain from expressing the opinion that the dry air, the winds, and the elevations of most parts of Colorado are more irritating to sensitive nervous systems than the climate of low, moist regions, and consequently more likely to aid in the development of chorea and similar nervous troubles."

In 1890, in a paper entitled "Nervous and Mental Diseases observed in Colorado," read before the American Climatological Association, after referring to the opinion just quoted, I stated that "during the past three years I have had the opportunity of treating and seeing in consultation numerous cases of chorea in Denver. So far, without a single exception, they have yielded to the ordinary treatment for this disease. Some cases have developed at low altitudes and from force of circumstances been brought to this city. These have yielded to treatment, but in one case the movements at first seemed to be exaggerated by the change to this altitude." In this instance the disease had proved rebellious to treatment at a low altitude. I concluded by stating: "My former statements will have to be modified by saying that chorea at this altitude (about five thousand feet) seems to yield about as readily as at sea-level, and with no greater tendency to relapse."

I have notes of only sixteen cases of chorea, excluding two cases of chronic chorea and one of hereditary chorea in the adult, observed in Colorado during a period of nearly seven years. Four years of this period I spent at Colorado Springs, population varying there from five to eight thousand, and the remainder of the time I have practised in Denver, with a population increasing from 100,000 to 125,000. These sixteen cases are all that I have seen, both in private and consulting work, notwithstanding that my practice is limited to the diseases of the nervous system. During the time that I have been in Denver, about two and a half years, I feel confident that I have seen more cases of chorea than the average general practitioner of medicine. When we compare these figures with those of other observers at low altitudes in reference to the frequency of the disease, it seems to me that infrequency is in favor of Colorado.

At the Arapahoe County Hospital, located in Denver, where a number of children are constantly cared for, I have seen but one case of chorea in two years. In the Foundling Home for Children, to which I am Consulting Neurologist, I have not known of a case of the disease for the same length of time. The number of my observations of the disease in Colorado is insignificant in comparison with the large number given by Gowers, Sinkler, and others, who have made their observations at low altitudes; but for the sake of contrasting the course of chorea in Colorado and at sea-level I will make the following comparisons:—

| Age. | Author's cases. | Age. | Author's cases. |
|---|---|---|---|
| At 3d year | 1 | At 10th year | 1 |
| " 5th " | 2 | " 11th " | 1 |
| " 6th " | 1 | " 12th " | 1 |
| " 7th " | 1 | " 13th " | 2 |
| " 8th " | 2 | " 14th " | 1 |
| " 9th " | 3 | | — |
| | | Total | 16 |

Average . . . $8\frac{15}{16}$ years.

Sinkler's cases (Pepper's System of Medicine, vol. v., 282). He states that in 282 cases, 217 occurred between the sixth and the fifteenth year. Taking his cases that occurred before the fifteenth year, we have:—

| | | | |
|---|---|---|---|
| Under 1 year | 2 | At 7 years | 23 |
| At 2 years | 6 | " 8 " | 24 |
| " 3 " | 4 | " 9 " | 31 |
| " 4 " | 7 | "10 " | 23 |
| " 5 " | 9 | "11 " | 18 |
| " 6 " | 24 | "12 " | 25 |

Average . . . $8\frac{35}{196}$ years.

Sinkler states that of 531 cases given by See, 453 occurred between the sixth and the fifteenth year.

Gowers gives no tables showing the different ages at which the disease occurred, but says that four-fifths of all cases occur between the fifth and the fifteenth year; about one-half of the first attacks occur between the fifth and the tenth year; but according to his observations, if relapses are included, more cases occur between the tenth and the fifteenth year than between the fifth and the tenth. The thirteenth year of life is that which presents the largest number of attacks. He states: "Under five the disease is extremely rare; a few cases have been recorded at four; and I have seen one case at the age of three-and-one-half."

I have seen but one case of chorea in the adult in Colorado, and this was in a man aged forty-six, the disease being hereditary, and begun when he was thirty-five years old. He was insane;

had delusions of persecution, and was homicidal when I saw him. The disease could be traced back through several generations of the family on the mother's side. It first manifested itself at or about the thirty-fifth year, and in every instance the disease became complicated with some mental aberration between the fortieth and fiftieth year.

*Sex.*—Author's cases, 16. Five were males and three were females.

In Sée's cases, quoted by Sinkler (531), there were three females to one male. In Sinkler's cases, 279, the proportion was two-and-one-third females to one male. Gowers gives the proportion 365 boys to 1000 girls.

*Rheumatism.*—In author's cases, 16, no positive history of rheumatism (acute), preceding the chorea, could be traced in more than two, 12½ per cent. In Sinkler's cases, 279, history of acute rheumatism, preceding the attack, could be traced in only 37 cases, or 13.73 per cent.

Gowers gives the proportion much higher, about 25 per cent. being preceded by attacks of acute rheumatism.

*Cardiac Complication.*—In author's cases, 16, four were attended with heart complications, as manifested by a murmur.

In Sinkler's cases, 279, in 84 a murmur was detected. I infer from the statements of Gowers that in about 30 per cent. of his cases some cardiac complication was found, either preceding or developing during the chronic manifestations.

*Relapses.*—Of the author's 16 cases, so far only two of them have had relapses; one case after an interval of nearly a year, and one after an interval of three months. This can give no idea of the relative frequency of relapses in Colorado, as sufficient time in some of the cases has not elapsed to expect relapses. In no instance so far have I seen a second relapse, but there is no reason why a second or third relapse should not occur, if the patients are sufficiently long under observation. Dr. Sinkler does not state how frequently relapses occurred in his cases. Gowers thinks relapses occur in one-third of the cases of chorea.

*Duration.*—Of the author's cases, 16. The duration in seven was two weeks; in five, three; in two, four; and in two, five, making the average duration about three weeks. Sinkler expresses no opinion in regard to duration, but gives the opinion of other observers, as three or four weeks. Gowers states "it is usually from six weeks to six months. It rarely falls short of the earlier limit, but I have known the disease in one or two instances to last only six weeks. The average duration has been found by more than one observer to be ten weeks."

An explanation of the probable cause of the short duration of my choreic cases is needed just here. I do not think it was due to climatic influences.

In those cases in which I have relied upon arsenic alone for the cure of the disease the duration seemed to be about as long as I found it in Philadelphia. Of late years it has been my almost invariable custom to precede the arsenical treatment by some antispasmodic agent, such as chloral or antipyrine, until the movements have been pretty well under control, which usually takes from a few days to a week, depending upon the severity of the case and the vigor with which the antispasmodic agent has been pushed, then to follow with Fowler's solution of arsenic, beginning with three or four drops thrice daily, and gradually increasing the size of the dose, by one drop daily until the point of toleration is reached or exceeded, when I order the medicine discontinued for a day or two. On resuming the arsenic I have the patient to begin with the dose which was reached when it was discontinued and again to increase the dose one drop daily until some unpleasant symptoms develop, when it is again discontinued as before, and resumed at the end of the second or third day at the dose last taken. By this method I frequently succeed in getting a child to take fifteen or twenty drops of Fowler's solution thrice daily. All choreic movements usually cease some time before this dose is reached, but by continuing the arsenic at the point of toleration for some weeks after all symptoms of the disease have disappeared, I have thought relapses have been less frequent. Certainly the duration of chorea is very much abridged by the free use of antipyrine before beginning with arsenic. Chloral in my hands has not been as satisfactory in overcoming the severe movements of chorea as I have found antipyrine. I think, if I mistake not, that Prof. H. C. Wood, of Philadelphia, was among the first to call attention to the beneficial effects of antipyrine in the treatment of chorea, and especially to its power of cutting short the disease. As all the sixteen cases which I have reported were treated with antipyrine, it is manifestly unfair to compare the duration of these cases with that of cases treated at sea-level without the aid of antipyrine. The duration of the disease when treated with antipyrine must be ascertained at sea-level, and in the mountains before a comparison of any value can be drawn in regard to this point. Below I give a tabular view of the sixteen cases observed in Colorado.

*Tabular View of the Author's* 16 *Cases.*

| Age. | Sex. | Character of Attack. | Duration. | Relapse. |
|---|---|---|---|---|
| 6 | Female. | Slight. | 3 weeks. | None. |
| 8 | Male. | " | 2 " | " |
| 3 | Female. | " | 2 " | " |
| 9 | Female. | Moderate. | 3 " | Relapse. |
| 11 | Male. | Severe. | 4 " | None. |
| 8 | Male. | Very severe. | 5 " | " |
| 9 | Female. | " | 5 " | " |
| 6 | Female. | Slight. | 2 " | " |
| 13 | Male. | " | 2 " | " |
| 14 | Female. | Moderate. | 3 " | " |
| 5 | Female. | Slight. | 2 " | " |
| 7 | Female. | Moderate. | 2 " | " |
| 10 | Female. | Severe. | 3 " | Relapse. |
| 12 | Female. | Moderate. | 2 " | None. |
| 9 | Female. | Severe. | 3 " | " |
| 13 | Male. | Severe. | 4 " | Relapse. |

So far I have seen but one case of hysterical chorea in Colorado. This had not materially changed at the end of two months, when the patient was taken East. No case of chorea complicating pregnancy has come under my observation in Colorado. I have not seen a case of chorea in the colored race in this climate.

The disease seems to be more frequent in the winter and spring here than during the summer and fall, agreeing with the observations of Weir Mitchell and Sinkler, of Philadelphia, but differing from those of Putnam, of Boston, and Gowers, of London, who seem to think that season has but little influence on the disease.

I have yet to observe my first case of chorea in Colorado in which unpleasant sequelæ, beyond a slight nervousness or incoordinated movements during excitement, have developed.

In conclusion, I am not prepared to say that chorea is not unfavorably influenced by the climate of Colorado, especially at the higher altitudes of the State; but the more I study the disease here the more firmly I am convinced that an undue prejudice exists in the minds of our physicians against the climate for this class of nervous derangements, and, in consequence, the evil effects of the climate on chorea, if such exists, is very much exaggerated. The latter statement is true, and verified by careful personal observations, for elevations of about 5000 feet.

I should not think of recommending Colorado as a resort for the treatment of chorea; still, if circumstances make it desirable for choreic patients to be brought to Colorado, but little unfavorable influence need be feared from her climate. It is probable that if cases of chronic or recurrent chorea were sent to Colorado considerable temporary improvement might be expected, and a return to a low altitude subsequently might result in a cure in some cases. One such case has come under my own observation.

# NOTE ON THE CONTAGIOUSNESS OF LA GRIPPE.

By BOARDMAN REED, M.D.,
ATLANTIC CITY, NEW JERSEY.

It seems well established that influenza is at times epidemic or pandemic; so that whole communities, or the population of entire countries are attacked with it almost simultaneously. But in many of the so-called epidemics, there has not been wanting evidence that the disease is also contagious in the ordinary sense of the word. Some authorities, however, have denied its contagiousness, while others have expressed doubt as to this point. A few carefully observed facts bearing on the subject should be of interest.

When the recent epidemic of influenza first reached New York, in November, 1890, the writer was in that city pursuing certain post-graduate courses. It was then observed by him that the disease was exceptionally prevalent among physicians, much more so than among the rest of the population. And when a case broke out in a family the other members were apt to come down with it in succession, rarely all at once. During the early weeks of the epidemic certain families were badly afflicted by it, one after another of the members being attacked, until all were ill, while other families remained entirely exempt till a much later date. This looked as if personal contagion had much to do with the spread of the disease.

During last winter and spring, when there was a return—a recrudescence, as it were—of the epidemic, the writer was enabled to study more closely the manner of its propagation, having resumed practice in Atlantic City at about the end of the first wave of the epidemic.

The latter first reached this place some weeks later than the time of its advent in New York and Philadelphia, and ran a much shorter and milder course, having exhausted itself in about one month, or about the middle of January.

The past winter, cases of influenza began to arrive here from New York, Pittsburgh, Chicago, and Philadelphia, in February, and visitors afflicted with it, or just convalescing from it, continued to come until late in April. The disease seemed to be identical in all respects with that which prevailed the previous winter, except that the majority of the cases observed were directly traceable to exposure to a previous case. The following cases will illustrate:—

A party composed of a gentleman, with his wife and two children, a bachelor brother, a maiden sister, and a widowed sister, with her son, came from New York to one of our hotels early in February. All remained well for several weeks, till the two sisters returned to New York and spent a few days there. The day after coming back the widow was taken with a mild, but typical attack of *la grippe*, her symptoms including headache, fever, debility and cough, with slight bronchial rales. The maiden sister nursed her, and three days later was seized with the same disease herself. The sister-in-law, who occupied a room just across the hall, with her two children, the husband being away at the time, was attacked just three days after the maiden sister, who on being taken sick had been put to bed in a room communicating with hers. At the same time, the brother, who was often in the sick rooms, was taken with the same disease. The older of the two children, a boy of two years, escaped, while the other, a baby of five months, came down with a light attack shortly after his mother. The widow's son, a sturdy young fellow of seventeen, who spent much time out of doors, also escaped the malady altogether. This party occupied rooms at one end of a corridor on the third floor of the hotel, and no other cases of the disease, so far as learned, occurred in the house for some time after this.

On Friday morning, March 20th, Mrs. R., wife of the writer, went to Philadelphia. She was engaged in shopping during Friday and Saturday, and attended church twice on Sunday. She was not aware of having been near any one suffering from *la grippe*, but, as it was prevailing in that city at the time, she was no doubt fully exposed to it. Sunday evening, while still in Philadelphia, she complained of pain and tightness in the larynx, hoarseness and malaise. On returning to Atlantic City, Monday, she was feverish, had marked symptoms of influenza, except that she had no headache or body pains, and was soon obliged to take to her bed. On Wednesday, our little four year old girl, who slept in the same room, was attacked similarly with fever, hoarseness, debility, and cough. On Friday, our son, nine years old, who slept in an adjoining room, was taken with the same feverish and catarrhal symptoms, including headache. All were quite sick for a number of days. The period of incubation in the foregoing cases was from two to three days.

The writer saw no cases in Atlantic City during the past winter until invalids recovering from the disease began to arrive from the neighboring large cities. After such arrivals it was observed that the bellmen, chambermaids, and clerks in the hotels were occasionally attacked as a result evidently of direct contagion.

The cases seen were generally mild and very manageable, the symptoms, even the catarrhal ones, yielding usually to moderate doses of quinine.

Attracted by the fame of Atlantic City as a health resort, residents of the grippe-stricken localities, when they felt the malaise which presaged the oncoming of the malady, often hastened here to ward off what they considered an approaching attack of malaria or nervous prostration. Many such persons were obliged to spend a few days in bed here with influenza, but most of them considered themselves fortunate in having a relatively aseptic air to facilitate their recovery, and the invigorating sea-breezes to hasten their convalescence afterward from the nerve-depression which was so prone to follow it.

# REVIEWS.

TEXT-BOOK OF HYGIENE: *A Comprehensive Treatise on the Principles and Practice of Preventive Medicine from an American Standpoint.* By GEO. H. ROHÉ, M. D., Professor of Obstetrics and Hygiene in the College of Physicians and Surgeons, Baltimore; Director of the Maryland Maternité; Member of the American Public Health Association; Foreign Associate of the Société Française D'Hygiène; of the Société des Chevaliers-Sauveteur des Alpes Maritimes, etc. 2d edit. F. A. Davis, Philadelphia. 1891.

THE first edition of this work is so well known to the profession that little need be said regarding the present one. The whole book has been ably revised, and in the articles upon air, water, and epidemic diseases, the more recent advances in bacteriological science bearing upon these subjects have been brought up to date.

In writing upon the atmosphere Dr. Rohé says that dust may be a carrier of pathogenic as well as non-pathogenic germs, and "it is probable, also, that the bacilli of tuberculosis, cholera, typhoid fever, and other organisms at times undergo multiplication in the air, and that the latter may be the medium of communication in these diseases, but it must be admitted that our knowledge on this point is at present rather vague and unsatisfactory." It is too true that our knowledge is vague and unsatisfactory, but in regard to tuberculosis we think Dr. Rohé might have made his warning a good deal more emphatic. We know, for instance, that there is *more* than a strong probability that tuberculosis is contagious, that the contagion is communicated from the sick to the healthy by the sputa, that this sputa is safe (as regards the atmosphere) in a moist condition, and becomes dangerous only when dried and mingled with the atmospheric dust; and we know also that consumptives expectorate all over our streets, and that the average American cities have streets badly swept and sprinkled; and here a danger exists that is only second to that of the typhoid bacillus in our drinking water; and the time will come when dust in cities will be looked upon in the same light as polluted water supply, and receive as much attention in a book on hygiene.

The article on water supply leaves little to be said. The popular belief, such as that running water purifies itself, that frozen water or ice is pure, or that water passing through clay or sand is properly filtered, is in every instance shown to be without foundation. Water once contaminated is unsafe, no matter how far from source of contamination. Experiments by Dr. C. P. Pengra have shown that bacteria, infusoria, etc. are not all killed by freezing of the water in which they live, some 9 to 10 per cent. retaining their vitality. While, as found by Dr. Prudden, the typhoid bacillus has remained alive after 103 days imbedded in ice. According to Dr. Rohé, wells are especially liable to contamination, after the ground has become more or less saturated with organic matter (such as occur in most of our typical farm-houses where the well is in the barn-yard); it does not act as a filter, and the well water is polluted dangerously.

We are glad that the doctor has made such a serious matter of water pollution, for it is the disgrace of our young and growing civilization that all over our splendid country, in the large cities and the small towns alike, thousands of lives are sacrificed yearly to typhoid fever, a disease which is strictly preventable, and a disease which gradually decreases in a corresponding rate with the improvements made as regards drainage and water supply. Not a fall goes by but offers up its victims by the score, as they come back to the cities from their summer outing in the watering-places. The germs develop in them that were taken with the polluted water that looked so fresh and with surroundings often so beautiful and health-giving.

Even in regular health-resorts where, if anywhere, hygiene should stand first, the supply is far from above suspicion, and we know of one such where without the slightest excuse (the water at the source being of crystal purity) this stream is grossly polluted, and all because the intelligent people are powerless before political influence and ignorance. Such things exist, and a book upon hygiene can and does do good work when it promptly and clearly points this danger out.

The articles upon food, ventilation, drainage, etc. are exhaustive and interesting, and in this book the physician will find a valuable help in his daily work and in all matters pertaining to preventive medicine in its broadest sense and from an American standpoint.

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## BIBLIOGRAPHY.

*The* EDITORS *request that Pamphlets and Reprints of Papers be sent them for notice or review under this heading.*

SOME OF THE PECULIARITIES OF THE CLIMATE OF CALIFORNIA, AND THEIR RELATION TO THE TREATMENT OF CONSUMPTION OF THE LUNGS. By T. D. MYERS, M. D., Philadelphia. (Pamph. pp. 13.)

To begin with the title is defective and misleading, by the use of the word climate in the singular. Our immense territory holds both the most elevated and the lowest-lying lands in the United States, and has all the varieties of mountain, foothill, valley, and desert, marsh, alluvial river bottom, lake region, area of active volcanic action, and long stretch of sea coast—in short, the greatest variety of climates to be found in any equal extent of territory in the world.

The misfortune of writers on the salubrity or insalubrity of climate is that they start out to write it up or down, and Dr. Myers is no exception to this rule. He exaggerates the objections which our own sanitarians have pointed out to California as a resort for consumptives, and quite unfairly uses Dr.

Tyrrell's expression that the State may become "the banner consumptive State of the Union." Neither Dr. T. nor any other intelligent physician of observation has any such fear from cases of this disease originating in the State. Such are indeed very rare; while recoveries of cases that would be considered hopeless elsewhere are not uncommon here.

In a paper "On the Climatology and Disease of Southern California," written by me for the State Board of Health in 1886, and published in the Ninth Biennial Report, I quote as follows: "Dr. C. B. Bates, of Santa Barbara, writes thus: 'This being a health resort, we have many cases of tubercular disease amongst our visitors. These diseases are rare, however, among the native white population, but common with the Spanish portion of the residents. This latter fact I ascribe—

"'First. To close intermarriage through a long series of years.

"'Second. To change of habits since the coming of the American (Anglo-Americans); they live more in their adobe houses, not so much out of doors as formerly, and poorer, perhaps not well nourished, and in many ways are not hygienically so favorably situated as in times past. Thirty or forty years ago, tubercular disease was rare among them; now, each year it becomes more common.'"

Dr. W. T. Lucas, of Santa Maria, writes: "We have more or less of phthisis all the time. But outside of the poorer class of native (Spanish) population, none to speak of, except among those coming in from other localities."

Dr. R. E. Curran, San Buenaventura, reports: "Phthisis pulmonalis is common among natives (Spanish). Americans mostly imported."

Dr. R. W. Hill, of the same place, writes: "Phthisis is increasing among the native Californians, due to insufficient and improper diet and clothing, and poorly ventilated dwellings."

Dr. Ira Perry, late of Nordhoff, writes: "Only one case of phthisis known to originate in this valley (Ojai) in five years. A girl of eighteen nursed her mother who died of the disease, and then continued to live in the same house until her own death from the same cause, a year or more subsequently. I think about one-half of the deaths here during the last five years were from phthisis pulmonalis—come from abroad. This is a resort for consumptives, many of whom die, as they will anywhere when setting at defiance the laws of hygiene with reference to food, air, and exercise. As a rule, the rich and lazy die; while nearly all who go to work improve."

Dr. W. L. Brown, of Downey City, writes: "I have seen many cases, but none that have originated here; nearly all cases that have come here as a last hope."

Dr. J. S. Griffin, of Los Angeles, writes: "Phthisis pulmonalis, formerly very rare among native Californians (Spanish), is more frequent during the past few years. Imported cases are numerous."

Dr. J. P. Widney, Los Angeles, reports: "This disease among the Spanish has been rare, but it is growing more frequent as they mingle with Americans. Still in the native-born population it is not so frequent as in the East and in Europe. Imported cases are very numerous."

Dr. J. H. Bullard, of Anaheim, writes: "Phthisis pulmonalis is occasional. Usually introduced. Not rare among white-Spanish offspring."

Dr. J. A. Crane, Santa Ana: "Have seen three or four cases which it is said originated here, and, pursuing a rapid course, ended fatally in a few months."

Dr. C. W. Brown, Pomona: "Most frequent cause of death here, but in immigrants almost wholly. Some cases in Mexicans."

Dr. John C. Kerr, Pasadena: "This is more frequent than any other disease; but almost all cases come from the East. I have seen several cases of local origin, but they were among Spanish, and were catarrhal in form."

Dr. C. M. Fenn, San Diego: "Like the poor, always with us; but it comes chiefly from abroad. White Americans seldom, if ever, contract it here." In a foot-note he writes: "While phthisis not infrequently carries off the native Mexicans and Indian races, I cannot recall a single case of a white person contracting the disease here."

The remarkable uniformity of these independent reports in regard to the introduction and rapid extension of phthisis pulmonalis among the Spanish natives demands at least a passing notice, especially when taking into consideration the rarity of its origination among the Anglo-Americans.

With the general absence of the accepted climatic factors conducive to the development of phthisis, the physical conditions above enumerated by Dr. Bates more particularly must be recognized as the remote cause of the race deterioration in this specific direction. It is not probable that the downward tendency, having been once positively determined, any arrest may be expected.

The rapid increase of the white races has steadily placed the Spanish at sad disadvantage. Here, as everywhere, the rich become richer, and the poor become poorer; and with the inevitable attendant evils of an impoverished condition, the near future will probably witness the extinction of these earlier occupants of this sunny southwestern shore, and phthisis will have not a little to do with the finale. But the pendulum, with an uniform propellant force behind it, must swing in an uniform arc. In-door residence, light-houses, whether of adobe (mud) or wood, abandonment of walking and horseback exercise, must eventually do for the rich American what similar conduct is effecting for the poor Spaniard.

The question of extension by contagion has not been broached by the reporters, except in the inferential case at Nordhoff, recorded by Dr. Perry. During the period covered by this report, three well-authenticated cases have been brought to my knowledge by a careful, conservative medical observer of Los Angeles. If the bacillus tuberculosis be accepted as the proximate cause, and the adoption of insanitary modes of life the remote, there remains no adequate barrier to the wide extension of phthisis here as elsewhere. The mildness of our climate attracts the feeble of all lands, and of these multitudes, cases of phthisis probably predominate in the proportion of ten to one. As has been demonstrated, the joint occupancy of bed or room by the consumptive and the well, acts unfavorably upon the latter; and in many instances is followed by health failure and early death from phthisis.

Whether a "propter" from this "post" may be argued or not, satisfactorily to all, the oft-observed fact remains. One of the most frequent occurrences throughout this region is this insanitary intimacy. Whether believers or not in the bacillus as a potential factor in the propagation of this, the greatest enemy of the human race, medical men everywhere owe it to the well to protect them, so far as may be, from the almost inevitable evil resulting from such unfortunate association.

If the bacillus theory be true, the great danger to the general public lies in the myriads of these microbes which are daily deposited on every thoroughfare in the sputa of the suffering multitudes. Cultivators assert that the most virulent form of tubercular sputum is the dried and pulverized. Thus, the sunshine and the breeze, health-giving and invigorating to the sick, may become the agents of destruction to the well. No needless alarm is proposed by these remarks, but in the interest of preventive medicine—the medicine of the future—the attention of sanitarians is urged with emphasis to this important subject.

Dr. Myers, in his article on page 7, says: "From what has been said of the smoke and the dust of the mountain regions; from the well-known heat, the dust, and the liability to the 'Norther' in the inland valleys; from what we know of the cold, the fogs, the winds and the dust (for it must be understood that while the fogs are dense enough to reduce the temperature, they are not dense enough to lay the dust) in the region along the coast, I feel that, after nearly five years' residence in the State, I am warranted in saying that, in my opinion, there is not a desirable climate for tuberculous invalids anywhere within the domain of California, in the summer."

After a residence of twenty-three years in this State, with ample opportunities to study the effects of climate upon this class of cases, I feel equally positive in stating that the Sierra Nevada Mountains, at varying elevations, to be determined by the intelligent physician in individual cases, furnish, whether in summer or in winter, the best possible climatic conditions for all patients whose cases are in any degree amenable to climatic relief.

If the dryness of the summer atmosphere favors the distribution of tubercle bacilli, as he thinks, it, in a greater degree, favors resistance to their destructive agency. In order to make out his case against us on account of the dampness of the rainy season, he has selected a spot where there is the greatest rain-fall.

"The region about San Rafael," the locality the doctor has selected to give force to his argument, has an exceptionally heavy rain-fall, an unfortunate fact for the value of his paper.

The annual precipitation at San Rafael, according to General Greely, of the United States Signal Service Bureau, is 38.98, or, in round numbers, 39 inches, and he states that during one season 56.40 inches of water was precipitated at this point. According to the same authority, the annual rain-fall at Santa Barbara is 17.29 inches; Los Angeles, 16.03 inches; and at San Bernardino, 1118 feet above sea level, 16.17 inches. The number of rainy days, days of entire or partial cloudiness, consequent upon the winter cyclonic movements, as cloudy weather seldom occurs otherwise, is proportionately small. The annual number of days at Los Angeles, on which an appreciable rain fell, deducted from a period of 13 years' observation, is but 42; these include days on which a measurement as small as .01 of an inch fell. Numbers of days occurred when a slight rain fell during the night or morning, but by early forenoon the sun shone from a cloudless sky; yet these days are classed as rainy days. The annual number of cloudy days during the same period, which also include days of rain-fall, a fact to be borne in mind, is 49, leaving 316 days in the year on which the sun shone brightly or was but partly obscured. During the summer season but six cloudy days occur on an average. These facts apply generally to California south of the Tehachipi, though with greater force as we proceed inland. A climate which will allow one, especially of a delicate constitution, to be in the open air 316 days in the year, when the diverging line between the days of cloudiness or rain and days of sunshine is wide apart, cannot be condemned on the ground of insalubrity.

We admit that we have more or less fog at certain seasons in the coast counties, but would say that very little ill results from it, if discretion is observed in dress and exposure; and if it were not for some cloudy or foggy weather, the perpetual sunshine of California would be too monotonous, if not debilitating, since it spares us the oppression due to the first days of spring in other climes.

We also admit the prevalence of dust in the towns and travelled roads of the country, but take exception to his declaration that there is no escape from it. The elevated regions before mentioned, and any other spots beyond the direct action of the ocean winds, are free from any reasonable objection on grounds of dust or too stimulating property of atmosphere.

On the whole, we find that he takes the objectionable features of certain localities, sums them up, and gives the amount as a standard of California climate. This kind of dealing would bring under condemnation any extended region of country, diversified like California; and by reversing this treatment of the case, any country might be made a sanitarium. In fairness, no one claims that the whole of California, or the greater part of it, presents surpassing advantages for consumptive invalids; but we hold that we have within our borders many spots highly favorable at one or another season, and some at all seasons.

In conclusion, I am pleased to note that Dr. Myers has so forcibly called the attention of the profession to the cruel custom, when all hope of recovery of consumptives is lost, of sending them away from home to die among strangers. And I fully concur in what he says, at the close of his paper, in regard to such cases, and especially to the following, on page 13:—

"I am also sure that when a tuberculous invalid reaches the stage in his disease when he loses interest in outdoor exercise, or when he finds such exercise attended with too much effort to permit him to enjoy it, he might as well leave Southern California, for all the good the climate is likely to do him. Indeed, when he reaches that stage when he is confined to the limits of the house, he will be infinitely better off at home, among his friends."

H. S. Orme, M. D.

Los Angeles, Cal.

# MONTHLY HEALTH REPORTS.

## CALIFORNIA.

### MAY.

REPORTS from sixty-six cities, towns, and villages, having an aggregate population of six hundred and eight thousand nine hundred and forty-five, show a mortality of nine hundred and forty-five from all causes. This is a percentage of 1.55 per thousand for May, or 18.60 per thousand per annum.

Consumption was fatal in one hundred and forty cases, being a reduction of twenty-four since April. Pneumonia was the cause of death in ninety-one, bronchitis in twenty-one, and congestion of the lungs in eleven. There were fifteen deaths from diarrhœa and dysentery, eight from cholera infantum, and thirty-four from other diseases of the stomach and bowels. Diphtheria caused thirty-three deaths, croup thirteen, scarlatina two, measles three, and whooping-cough eight. Typho-malarial fever is accredited with three deaths, typhoid fever with twenty, remittent and intermittent fevers seven, and cerebro-spinal fever three. Cancer caused twenty-four, erysipelas three, heart diseases fifty-eight, alcoholism eight, and all other causes four hundred and twenty.

#### PREVAILING DISEASES.

CHOLERA INFANTUM was reported at Fresno, San Pedro, Ione, Santa Paula, and Cottonwood.

DIARRHŒA has been quite prevalent, Willows reporting twelve cases, Modesto one hundred and eleven. It prevailed also at Ione, Etna, Mills, Oakdale, Eureka, Lincoln, Bakersfield, Pleasanton, Santa Paula with eleven, Vacaville, Middletown, San Pedro, Mariposa, College City, Red Bluff, and Fresno with seventy-five cases.

CHOLERA MORBUS was reported from Fresno, Modesto, Red Bluff, College City, Benicia, San Pedro, Pleasanton, Galt, Wheatland, and Williams.

DYSENTERY was reported from Williams, Ione, Downey, Gridley, Vacaville, San Pedro, Red Bluff, Modesto, and Fresno with forty-two cases.

SMALLPOX has not been reported, but there is one case in the Sacramento City and County pesthouse. It is believed to have been contracted at El Paso, Texas. Sufficient time has not elapsed to determine if the contagion is to spread. There are also cases of this disease at the U. S. Quarantine Station, near San Francisco, all of which are recovering.

MEASLES appear to be epidemic in Ione, one hundred cases being reported. There were ten at Red Bluff, forty-two at Fresno, eleven at Wheatland, twenty at Oakdale, sixteen at Bakersfield. It was also reported from Santa Paula, Truckee, Dixon, Vacaville, Mariposa, Lincoln, Etna Mills, Galt, and Sacramento.

SCARLATINA was reported from Ventura, Vacaville, Napa, Bakersfield, Oakdale, Ione, Modesto, and Sacramento.

DIPHTHERIA was reported from Modesto, St. Helena, Dixon, Truckee, College City, Eureka, and Napa.

FEVERS OF A MALARIAL TYPE have prevailed in Mariposa, Lincoln, Vacaville, Cottonwood, Sausalito, Pleasanton, Truckee, Gridley, San Pedro, Bakersfield, Ione, Red Bluff, Fresno, Wheatland, Oakdale, Etna Mills, Galt, and Williams.

TYPHOID FEVER has not prevailed to any great degree throughout the State. It is confined principally to the larger towns and cities.

DISEASES OF THE RESPIRATORY ORGANS coming under the head of pneumonia, bronchitis, and congestion of the lungs, have abated somewhat; but one hundred and thirty-three deaths from these causes, exclusive of consumption, show that they prevail.

Three hundred and five cases of la grippe have been reported from twenty-seven localities quite widely distributed.

San Francisco, Oakland, Los Angeles, San José, San Diego, Alameda, and Sacramento do not report prevailing diseases, the above reports being furnished from other sources.

The population is given according to the latest Census Report as published by Bancroft & Co., of San Francisco. It makes in many instances a material difference from former figures, but the discrepancy is explained when it is understood that many reports are taken from a wide area of territory covering many miles and attributed to one small town and vicinity. If, however, it is shown that any injustice is being done, a correction will at once be made.

J. R. LANE, M.D.,
*Secretary State Board of Health.*

SACRAMENTO, June 10, 1891.

# ABSTRACT FROM CURRENT LITERATURE.

IN CHARGE OF H. W. CATTELL, M.D.

*The* EDITORS *request that Reports of Papers read before Societies, Reprints of Articles, Letters from Physicians containing matters of General Interest pertaining to the Subjects in the Title-page of this Journal should be sent to the* EDITORIAL OFFICE, 913 WALNUT ST., PHILA., *marked for* CLIMATOLOGIST.

## BACTERIOLOGY.

**Remarks on a New Method (Interlamellar Films) of Studying the Development of Micro-Organisms and the Mutability of their Characters and Properties.**—SHERIDAN DELÉPINE considers the simplest way of solving the vexed question of the constancy or of the mutability of pathogenic bacteria to be in the isolation of one spore and the following of its development through all its stages and in different media. Having failed by the dilution method of Brefeld and by the plate and drop cultivation to obtain the desired results, the author was led to adopt a new mode of cultivation, which, while by no means perfect, has yielded some satisfactory results. The principle of the method is to inclose a thin layer of the nutrient medium between two parallel plates, so as to force the organism to grow in definite directions. If evaporation be prevented, the effects of capillarity are such that the most fluid media becomes fixed and can be used. At each end of a glass side (1½ inches by 3 inches) a narrow slip of glass is fixed so that the slides can be piled one upon the other in the incubator, or inverted on a sterilized plate. Upon the upper surface of the heated slide three small drops of sealing-wax are dropped. These drops are used to support a cover glass an inch and a quarter in diameter at a certain distance above the slide. The slide being sterilized, a drop of nutrient fluid is placed upon it, and the slide inverted or placed under a thoroughly sterilized plate. The cover glass is then sterilized, and the surface which is to be next to the slide is carefully protected from the access of any germ or dust. On this surface a very small drop of sterilized material is placed, and this drop is touched with a wire charged with a few organisms. A number of cover glasses are thus prepared and examined with a pretty high power, the inoculated surface being placed downwards. When a slide is found containing the number or kind of organism desired, it is gently placed over the drop of nutrient material on the slide. A heated rod is then applied successively over the three drops of sealing-wax until the inoculated fluid has spread evenly and to the thickness required. The slides are then transferred to a moist chamber in an incubator. Slides thus prepared can be studied at pleasure. Delépine has followed the development of bacteria and spores of pathogenic

Pyrenomycetes for days and weeks. By this interlamellar method the branching of the schizomycetes, and even the formation of oxalic acid out of gelatine, starch, gum-arabic, and possibly cellulose can be demonstrated. The formation of oxalic acid only begins when growing filaments have free access to air. Further details regarding the modifications which have been suggested by circumstances and the general nature of the results obtained are promised in a future paper.—*The Lancet*, June 13, 1891.

## CLIMATE.

**On the Relation of Atmospheric Electricity, Magnetic Storms, and Weather Elements to a Case of Traumatic Neuralgia.**—Captain CATLIN, of the U. S. Army, gives an abstract of his paper on this subject, which will appear in full in the proceedings of the American National Academy of Sciences. A few of his deductions are added.

"In the relationship of atmospheric electricity to pain, it is shown that by a comparison of 120 daily curves taken on neuralgia periods with the mean of the same number for ten consecutive days of each month, pain seeks identity with both lower positive curves and with the negative, and with fluctuations of great amplitude."

"The comparison of the weather elements, such as pressure, temperature, force of wind, humidity, relative and absolute, days of rain, depth of rain, hours of sunshine, number of storms, and ozone—with pain—covers a period in no case of less than five years."

"Of these the increasing temperature curve, the hours of sunshine curve, and the absolute vapor curve, operate to diminish pain, while all the others are identified more or less with pain. In the monthly products for fourteen years it appears that the 'depth of rain,' ozone, and 'number of days of rain,' in this order, but almost equally, constituted the best standards for pain measurement; by generalizing on the extremes through all these years, by taking the twelve months of greatest pain and the twelve months of least pain, the above conclusions are verified, and the law stated in general terms, as follows: Maximum pain bears a direct proportion to storm frequency, and an inverse proportion to temperature and elastic force of vapor; and minimum pain bears an inverse proportion to storm frequency, and a direct to temperature and elastic force of vapor; while depth of rain accompanies the number of storms and maximum pain. Charts of relative storm frequency and geographical pain charts are thus related."

"The daily pain curve exhibits three pain maxima; the first at 11 A. M., the second at 2 P. M., and the third at 7 P. M. The part of the curve at 6, 7, and 8 A. M. has almost an inverse counterpart in 8, 9, and 10 P. M., but in the curve from 9 A. M. to 7 P. M. there is a very important minimum at 12 M. and 1 P. M., then a subordinate minimum at 3 P. M., very like that at 10 A. M., followed at 5 and 6 P. M. by a distinct minimum. By placing on the pain curve the storm curves for the sixteen-year period, it becomes manifest that while the absolute values of rain depths and number of storms on the pain curve do not show a full correspondence, it is, however, clear at once that there is a relative value between the two and the pain."—*The Medical News*, May 2, 1891.

**The Comparative Climatology of London and the Chief English Health Resorts.** By BERTRAM THORNTON, M. R. C. S., L. R. C. P. London, H. K. Lewis, 1891, pp. 15.—Bertram Thornton has reprinted his article on the above subject, which first appeared in the Lancet. Tables have been added giving the mean temperature and humidity of various places in England. It is remarked, in reviewing the pamphlet, that a study of the comparative geology of health resorts is wanted, as the soil determines the humidity, radiation, evaporation, and a host of factors constituting the "climate" of a place.—*The Lancet*, May 9, 1891, p. 1016.

## DIET.

**Substitution of Oleomargarine for Butter at Restaurants in England.**—According to the act regulating the sale of food and drugs, in England, it is distinctly an offence to serve, at a restaurant, a person with oleomargarine, when he asks for butter. Taking advantage of this act, the bread and butter of no less than 42 coffee-houses in the parish of St. Marylebone were recently sampled. From this number 14 convictions were obtained, and fines varying from twenty-five cents up to eight dollars were inflicted. The bread, in each case, was found to be pure, and the fines were imposed for the substitution of oleomargarine for butter.—*The Sanitary Record*, June 15, 1891.

## LIFE INSURANCE.

**Prevalence of Albuminuria in Persons Apparently Healthy.**—Dr. W. B. DAVIS, of Cincinnati, Ohio, read a paper before the American Med. Assoc., May 5, 1891, on the "Prevalence of Albuminuria in persons apparently healthy," in which he narrates the further history of a case reported by him May 20, 1890. "On March 5, of this year, 1891, I made a careful urinalysis of this person's twenty-four hours' urine, examining separately each specimen as voided, and then mixing them together and again examining a sample of the whole quantity. The tests used were cold nitric acid—contact method—and boiling, then adding a drop or two of nitric acid and again boiling. The following are the results, viz:—

| | Color. | Reaction. | Spec. grav. | Albumen. |
|---|---|---|---|---|
| Urine passed at 7 A. M. | Dark straw. | Acid. | 1.030 | No albumen. |
| " 11 A. M. | Straw. | " | 1.020 | Faint trace. |
| " 3.15 P. M. | " | " | 1.028 | " |
| " 7 P. M. | " | " | 1.020 | " |
| " 9 P. M. | Dark straw. | " | 1.028 | Small quantity. |
| " 10 P. M. | Straw. | " | 1.020 | A trace. |

"Whole amount of twenty-four hours' urine, 32 ounces; reaction, acid; color, dark-straw; specific gravity, 1.025; albumen, a faint trace. Without the addition of the 9 P. M. urine, albumen was not discoverable. The 9 P. M. urine was the only sample which gave any deposit of sediment after standing twenty-four hours. A microscopical examination of this sediment resulted as follows, viz:—

"1. *Casts.* Only an occasional hyaline cast.

"2. *Crystals.* Calcium oxalate crystals present in great numbers.

"3. *Epithelium.* Pavement and small round bladder epithelial cells present in small numbers.

"Another examination of his urine was made on March 21, 1891, with about the same results, except that less reaction was obtained than on any former examination. The night urine contained no albumen, and the urine passed two hours after his midday lunch contained the most albumen; after standing twenty-four hours it constituted one-twentieth of the urine in the test tube. The specific gravity of the twenty-four hours' urine was 1.028, reaction acid, color, dark-straw. During the six years he had been under my observation his twenty-four hours' urine has never exceeded 40 ounces in quantity and the specific gravity has never been lower than 1.020. His early morning urine has never contained albumen, although it has invariably been present in small quantity at some hour later in the day. He has always been and still is in the best of health seemingly. He has not had a day's illness in ten years. He has not had rheumatism, gout, lead-poisoning, syphilis, nephritis, dyspepsia, or dropsy. No member of his family has had any of the above diseases or any history of Bright's disease. In his case there is no increase of vascular tension, no cardiac hypertrophy, palpitation or dyspnœa, and no retinal symptoms. He is thirty-six years of age, temperate in all his habits, happily married, prosperous in his business, resides in a suburban home where he spends his time after business hours. This case of albuminuria, which I present to you, is not a hypothetical—a supposititious case, such as our learned brethren of the bar are accustomed to fire at the unfortunate disciples of Æsculapius, when they get them at short range upon the witness-stand, but he is a living being, like ourselves, who has been under my observation for the past six years. His case is not an exceptional one, but a typical one, and has been observed, studied, and recorded the world over."

Dr. Davis then proceeds to quote a number of authorities upon the frequency with which albuminuria is found in persons considered healthy and also the percentage of albuminuria in applicants for insurance, the latter varying in their estimates from two to ten or more per cent.; indeed 43 per cent. is given by one authority, and Fosner is quoted as finding albumen in all normal urine! We are naturally led to infer that either the tests employed are entirely too delicate for ordinary life insurance work, or that something that is not pathological albuminuria, but akin to it, is discoverable by the ordinary tests for albumen. The remainder of the paper reads as follows:—

"It is somewhat remarkable that the recorded observations in our country show a very low percentage of albuminuria in persons apparently healthy, when compared with those of our British and Continental cousins. I asked Dr. Victor C. Vaughan, Professor of Chemistry in the University of Michigan, why it was that physicians in Great Britain and Europe, men of undoubted ability and world-wide fame, were finding albumen in the urine of 20, 30, 50, 70 and 100 per cent. of healthy persons examined by them, when the highest per cent. reported in our country was but from 10 to 20 per cent. In reply to my inquiry he wrote: 'I will agree to the statement that *proteids* are frequently found in the urine of the healthy or those who, so far as they themselves or any one else may know, are healthy,' and he called my attention to an article on 'The Proteids of the Urine, with a Comparison of the Tests for Albumen,' by F. G. Novy, M. S., Instructor in Physiological Chemistry, University of Michigan (Medical News, vol. 53, 1888), and said: 'You will see from this article, to which I have referred you, that with some of the proposed tests you can find albumen in the urine of almost any one.' In this article Mr. Novy calls attention to the fact that serum-albumen is the only proteid which the average physician expects to find in the urine. Whereas, globulin, hemi-albumose (Bence Jones's albumen), and peptone are also frequently present. In the ordinary methods for testing for albumen, all of these proteids but peptone may be readily mistaken one for another, and, indeed, he says, 'this has been rather the rule than the exception.' Serum-albumen is generally considered to be indicative of structural disease of the kidneys, but the other proteids have no such grave significance; nevertheless, serum-albumen is usually accompanied by larger or smaller quantities of globulin, and in some instances even peptones may be present; 'our ordinary tests for serum-albumen are also responded to by globulin, and hence, when applied to an albuminous urine, they indicate, as a rule, a greater amount of serum-albumen than that actually present.'

"Globulin usually accompanies serum-albumen and may be present in almost all varieties of albuminuria, though in variable quantity. According to Hammaisten, it constitutes from 8.13 to 60.24 per cent. of the total proteids in albuminous urine. The more recent investigations of Maguire indicate that globulin can exist in the urine by itself, even without serum-albumen being present, and he reports three cases of cyclic or functional albuminuria, and one of puerperal albuminuria, where he found the proteid of the urine to consist solely of globulin. Novy also mentions one case of functional albuminuria which came under his observation where globulin alone was found in the urine. These reports accord with the statement I made in my paper on 'Functional Albuminuria,' read before the American Medical Association, May 22, 1890, viz:—

"The present line of investigation is pointing strongly toward globulin as the form of albumen which is likely to be found in the various forms of functional albuminuria when chemistry will furnish us with simpler methods and more reliable reagents for its discovery."—*Proceedings of the American Medical Association*, June 13, 1891.

# THE EIGHTH ANNUAL MEETING

OF THE

# AMERICAN CLIMATOLOGICAL ASSOCIATION

WILL BE HELD IN

## WASHINGTON, D. C.,

**September 22d, 23d, 24th, and 25th, 1891.**

CONJOINTLY WITH THE

## SECOND CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS.

*The Association has selected "The Arno" as its headquarters, located only one square from the Hall of Registration. Terms, $3 to $4 per day on the American plan; rooms $1 upwards on the European plan. Members are advised to write immediately for rooms. Address, William A. Woods, Manager, Hotel Arno, Washington, D. C.*

## PRELIMINARY PROGRAMME.

**The following Papers are already promised. Their Order of Sequence will appear Later.**

The Histological Changes which take place in the Lungs in Cured Phthisis and the Influence of Diatheses in the Development of such Changes . . . . . . . Dr. ALFRED L. LOOMIS, New York.

A Study of the Sputum in Pulmonary Consumption. Dr. E. L. SHURLY, Detroit.

The Medical Treatment of Pleuritic Effusions. Indications for Aspiration . . . . . . . . . . Dr. G. M. GARLAND, Boston.

The Surgical Treatment of Acute and Chronic Empyema. Dr. MAURICE H. RICHARDSON, Boston.

The Drainage of Pulmonary Cavities . . Dr. CHARLES DENISON, Denver.

Nervo-Vascular Disturbances in the Unacclimated in Colorado. Dr. J. T. ESKRIDGE, Denver.

Notes on General *vs.* Local Treatment of Catarrhal Inflammations of the Upper Air Tract . . . . . Dr. BEVERLEY ROBINSON, New York.

The Effects of Climate in the Treatment of Chronic Diarrhœa. Dr. W. W. JOHNSTON, Washington.

The Limitations of Bacteriological Therapeutics, with especial reference to Tuberculosis of the Lungs . . . Dr. E. P. HURD, Newburyport.

Attempts to Discover Specifics for Phthisis Dr. H. F. WILLIAMS, Brooklyn.

Further Considerations of the Analysis of Recorded Cases of Phthisis Pulmonalis . . . . . . . . . Dr. S. A. FISK, Denver.

**The Pre-tubercular Condition . . . Dr. J. H. TYNDALE, New York.**

**Lymphatism . . . . . . . Dr. F. H. BOSWORTH, New York.**

**The Effect of Change of Posture in Heart Murmur.**
**Dr. N. Y. BOWDITCH, Boston.**

**Early Diagnosis and Treatment of Phthisis. Dr. R. C. M. PAGE, New York.**

**Early Diagnosis of Pulmonary Tuberculosis and its Importance.**
**Dr. KARL VON RUCK, Asheville.**

**Gymnastic Exercise as a Prophylactic and Remedy in Chest Diseases.**
**Dr. E. O. OTIS, Boston.**

**The Etiological and Therapeutic Relations of the Different Forms of Tubercular Disease to the Climate of High Altitudes.**
**Dr. H. B. MOORE, Colorado Springs.**

**The Climate of the Hawaiian Islands . . Dr. T. MUNSON COAN, New York.**

**Whooping Cough and its Management. The Difficulties of Climatic Treatment . . . . . . . Dr. J. H. MUSSER, Philadelphia.**

**The Waters of Richfield Springs . Dr. C. C. RANSOM, Richfield Springs.**

**An Experience with Diphtheria at a High Altitude.**
**Dr. W. A. JAYNE, Georgetown, Col.**

**Reports on the Late Epidemic of Influenza.**
**Dr. JOHN C. MONRO, Boston; Dr. A. ALEX. SMITH, New York; Dr. ROLAND G. CURTIN, Philadelphia; Dr. E. FLETCHER INGALS, Chicago; Dr. HENRY B. BAKER, Lansing; Dr. J. C. MULHALL, St. Louis; Dr. R. J. MUNN, Savannah.**

**The Epidemiology of La Grippe.**
**Drs. R. G. CURTIN and E. W. WATSON, Philadelphia.**

**Papers are also promised by Drs. A. JACOBI, New York; S. H. CHAPMAN, New Haven; F. F. SMITH, St. Augustine; GEORGE H. ROHE, Baltimore; A. S. GARNET, Hot Springs; W. C. GLASGOW, St. Louis, and H. M. WILSON, Denver.**

**It would be a great convenience to the Secretary to have the titles of papers intended to be presented, sent in as early as possible.**

**The completed programme will be issued, as provided in the Constitution, two weeks before the date of the meeting.**

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## OFFICERS OF THE ASSOCIATION—1891.

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# THE CLIMATOLOGIST.

## A MONTHLY JOURNAL OF MEDICINE.

VOL. I. SEPTEMBER, 1891. No. 2.

"INTRODUCTION.

"The object of this JOURNAL is to promote original investigation, to publish papers containing the observations and experience of physicians in this country and Europe on all matters relating to CLIMATOLOGY, MINERAL SPRINGS, DIET, PREVENTIVE MEDICINE, RACE, OCCUPATION, LIFE INSURANCE, AND SANITARY SCIENCE—and in that way to supply the means by which the general practitioner and the public at large will become better acquainted with the diseases of this country and Europe, and better armed to meet the requirements of their prevention or cure. The study of these subjects in this country is exciting great and increasing interest, and all admit that, from the little knowledge already possessed of its resources, possibly every known combination of atmospheric condition, soil, altitude, climate, or mineral springs, is to be found on this continent. It is confidently expected that *a journal devoted to the study of all diseases into which climate, soil, race, occupation, hereditation, diet, contagion, etc., enter more or less as factors*, will receive the encouragement of all, and become eventually an authority upon all subjects which are included in its title, although a thorough review of all progress in the departments mentioned will not be neglected. Especial attention will be given to the publication of *original material*, and it is to be hoped that physicians of all sections of the country will send papers upon any subjects which will be of general interest—such as the diseases of their locality—those incident to occupation, race, or climate, the study of epidemics, the questions of proper food, of the water supply, its potability and distribution, and all matters relating to drainage and diseases dependent on it.

"Original papers based upon experimental studies, or laboratory investigations in bacteriology, will form a prominent portion of the material presented during the year.

"Special attention will also be paid to the subject of health resorts, descriptions of Sanitariums with special reference to their suitability to certain cases, and the proper selection of patients to be benefited by different resorts. The utmost care will be taken that this JOURNAL shall assume and maintain the highest scientific character. It will be absolutely independent in its principles—*fair towards all*. It will depend for its maintenance upon the support given to it by the profession, as it is not published in the interest of any special section or clique."—*August*, 1891.

# THE PERSONAL EQUATION IN THE TREATMENT OF PHTHISIS.[1]

By S. E. SOLLY, M.D.,
COLORADO SPRINGS, COLORADO.

THE influence that the conduct and temperament of the consumptive exert over the progress of his disease is the question that I desire to bring to the attention of this association. We all of us doubtless agree that the amount of prudence and intelligence shown by the invalid in the care of his case greatly modifies the results. Further, that his general physique and his temperament are important elements in determining improvement or deterioration. Nothing, however, has been done, so far as I can ascertain, to demonstrate by statistics what are the proportionate influences of wisdom and unwisdom, of the quality of the physique, and of the special kind of temperament. The difficulty in correctly classifying each case and the difference in definition, and in reading the signs of each quality, among the various observers, has doubtless stood in the way of such attempts being made, and at the best it is to be admitted, in dealing with many cases, that a large margin must be allowed the exact figures given for the precise influence of such factors as conduct and temperament. It is only when the main points are agreed upon, the material plentiful, the observers many, and their opportunities of judging of these personal matters frequent and scattered over a good portion of the period of illness, that such facts can be arrived at. It is not the consultant who sees the patient once or twice, and is ignorant of his daily history, who can determine how far over-exercise or sloth, apathy, or worry, lack of physical resistance, or excess of reaction, has been displayed during the months or years of the sickness, so as to bring the patient correctly under the special denominations used in the classifications which follow,

[1] Read before the Colorado State Medical Society, June 17, 1891.

but it is for the physician in charge to furnish the facts upon which such matters can be determined.

Admitting that it is possible to produce a rough scheme of classification out of elements so indefinite and complex, and then to demonstrate the influence of each class, it may be urged *cui bono?* The answer is that, although we are probably correct in our general common-sense views of these subjects, and we usually influence our cases so as to mitigate the various evils arising from the different elements, yet, although it is well to *believe* rightly, it is still better to *know* correctly, even though in each case the consequent treatment be the same. Further, our patients will hearken to us the more, when we can speak to them to the effect that the percentage of improvement is much greater among the wise invalids than among the foolish who perish by their own folly, in the proportion shown by the statistics of so many thousand cases. The physician, also, if he knows the relative percentage of danger that lurks in the special physique or temperament of his patient, is forewarned and so forearmed, and thus can shape his treatment and his prognosis with greater accuracy.

With these objects in view I have further analyzed the 141 cases of phthisis treated by me in Colorado, which I reported to the Climatological Association last September, and now present the resulting tables for your consideration. The number of cases are too few to be able to found upon them absolute proof of any of the points inquired into; and these statistics can be taken only as in a greater or less degree foreshadowing what is the nature of the truths to be discovered by longer and ampler investigations. As the whole question of the value of these figures rests upon the quality of the material on which they are based, and the opportunities enjoyed by the observer for forming his conclusions, I shall begin with a *résumé* of the previous analysis of the 141 cases before taking up the special one that I now desire to bring before you.

These cases are from the records of my practice in Colorado Springs during the past sixteen years, and were taken as they were able to be followed up accurately to date. In order to allow a reasonable time to elapse to judge of the results, none were taken whose first visits were paid less than two years before the report was made, and in most of them many years ago. The number was limited to 141 for comparison with a like number treated in the Alps and reported on by Dr. C. Theodore Williams. The cases were not in any way selected, but as the history of any one was completed it was put in the tables, until the required number was reached. Although not giving a continuous record, yet taken as they were at random as regards results, and being widely scattered over the period of my practice, as the dates will show, they may be considered to give a fair average sample of it. The results of each case can be relied upon as known to me and not merely inferred. In the analysis I followed closely the plan of Dr. Williams, and gave each case under the same headings, viz.: *Number of case; name; sex; date of first visit; nature and extent of disease; length of illness; family predisposition; hæmoptysis; length of residence.* Next follows the result under the various headings of: *General results; weight; local results; chest circumference; notes.* The opinion that the results shown by these cases are, in spite of their fewness, average ones is shown by their close resemblance, where the quality of the cases was alike to those of all other observers which I could obtain, and which I present further on. I have confined myself, so far as possible, to practical conclusions and the main points, omitting details for the sake of clearness and brevity. The diagnosis of the cases in almost all instances was confirmed by several physicians, and in the later cases the presence of bacilli in the sputum was demonstrated.

Those which are put down as *cured* were those in whom all symptoms, both local and general, had disappeared, and who were known by me personally, or through their physicians elsewhere, to be in good health within a month or so of the time of making the report. That occasionally, at least, all detectable signs disappear, even in cases where marked cavities have existed, is the fact; and within the past week I examined with a colleague, and passed for life assurance as perfectly sound, a gentleman in whose paper we detailed the well-authenticated history of rapid phthisis and a considerable cavity, which had brought him to Colorado eighteen years before. The other divisions of results were *greatly improved, improved, worse,* and *died.* The *greatly improved* had apparently perfectly recovered, except for some remaining evidence in the lungs of past disease, or slight partial disability in general health. The *improved* were those in whom the disease was in a state of arrest, or slowly improving; in whom the tendency to death was apparently averted; in whom there might have been some advance of disease since coming; and in whom there were still some local or general evidence of disease; but of whom it was fair to say they were improved by their residence in Colorado. The number grouped under the heading *worse* were few, as in most cases the time of observation being prolonged they had terminated in death. Under the head of *died* are all those who died of the disease in Colorado or elsewhere. For the purpose of more ready reference and comparison I have also grouped the results under two headings only, viz: *cured* and *benefited*, benefited including the first heading cured, as well as the greatly improved and improved.

SEX.—There were 35 females and 106 males.

CONDITION OF LIFE.—Of all sorts, but none in actual want or poverty.

AGE.—Females, average age 23 years. Males, 30.7 years.

DATE OF FIRST VISIT.—Usually within the first few weeks of residence.

LENGTH OF ILLNESS.—This was the period between the appearance of the first symptoms and the first visit. Average length of illness: Females, 19 months. Males, 24 months.

HEREDITY.—Present in 57.14 per cent. of the females, and in 56.6 per cent. of the males, or 58.1 per cent. of the total of 141 patients. There was more or less benefit in 70; *i. e.*, 73 per cent. of the hereditary cases, (Dr. Fisk's 100 cases, referred to later, showed nearly the same, viz., 73 per cent). These are a little above the average improvement among the total number, which was 68 per cent., suggesting that perhaps the knowledge of heredity made these invalids take earlier and better care of themselves than those who, not having this warning, were slow to believe in the serious character of their indisposition.

HÆMOPTYSIS.—Occurred in 55.31 per cent. Recurrence took place in 12.76 per cent. of the whole 141 after coming to Colorado, that is, in 21.79 per cent. of those who previously spat blood. 64.1 per cent. of all who had hæmoptysis were benefited, which is somewhat less than the total average of improvement.

PYREXIA was more or less present in 56.73 per cent., of whom only 60 per cent. improved, which was decidedly below the average improvement.

HISTORY AND NATURE OF CASES.—5 had pigeon breast; 2 syphilis; 3 heart displaced; 3 marked cardiac dilatation; 1 old mitral regurgitation; 1 asthma; 20 tuberculosis (besides pulmonary), viz., 3 anal fistulæ, 2 of hip, 3 aural, 2 of testicle, 2 renal (lardaceous), 2 glandular (cervical), 7 laryngeal (unmistakably tuberculous); and besides these, 13 had marked symptoms of laryngeal congestion, with more or less aphonia, which in several suspiciously suggested early tubercular deposit. Of the 7 undoubted cases of tubercular laryngitis 2 improved and 5 died, giving of improved 28.57 per cent. Of these 7 in all but one there was, at least at first, some improvement and healing of ulceration, and in some the ulcers remained healed till within a few weeks of death. Of the 13 dubious and the simple chronic laryngitis cases 61.53 per cent. improved.

STATE OF THE LUNGS.—43.97 per cent. were in the first stage or that of tuberculization, 34.47 per cent. in the second or that of softening, and 21.27 per cent. in the third—that is, with cavities—and 16.3 per cent. had both lungs affected. In 83.68 per cent. one lung only was diseased. Of these the right was affected in 42.55 per cent., the left in 41.13 per cent. Of the 62 cases in the first stage, 16 had signs limited to one apex, all of whom improved. 17 were limited to both apices; of these all but 3 improved; one of the 3 would probably have improved had he not gone home too soon; 4 had more or less tuberculization scattered through both lungs.

LENGTH OF RESIDENCE.—This does not convey an accurate idea of what was the length of time needed to effect permanent improvement or a cure, because so many invalids make their permanent residence in Colorado, as they often find opportunities to engage in work or business, and always pleasant society, and a climate in which they can live agreeably all the year round.

RETURNED HOME.—41.84 per cent. left Colorado, of whom 61.44 per cent. are still to-day in the improved class—less than the average improvement—while of those who remained in Colorado 82.76 per cent. are improved. This would show that several more of those who left would have improved if they had remained longer. While of those who stayed some undoubtedly could have left in safety—19 cases, for instance, being evidently cured. I believe it may be assumed that 50 per cent. of those who come with phthisis to Colorado may in a longer or shorter time return without danger to their homes unless the surroundings and attendant circumstances to which they return are unhygienic. My observations in this regard corroborate the opinion of Weber, Williams, and others, that patients cured at an altitude have at least as good and probably a better chance of keeping well at home than those cured at or near sea-level.

Gross Results.—Of the total number, the percentage benefited was 67½ per cent., and cured 33⅓ per cent.; while in the first stage alone 58 per cent. were cured and 87 per cent. benefited. In the second and third stages combined 14 per cent. were cured, and 52 per cent. benefited.

For the purpose of showing that, although the number of cases is small, one is justified in believing that they bear a close resemblance to the results that would be obtained from a much larger number, and are a fair sample of the results of most of the cases treated in high climates which have been reported upon, I offer for your inspection a table that is published in my article on Climate, in Hare's System of Therapeutics, giving the results of treatment in high climates, gathered from all the reports I was able to obtain. It will be noticed that the results are grouped for the better comparison under two headings only, namely, cured and benefited. Of the six observers, the first three, viz: Drs. Weber, Williams, and Johnson are consulting physicians who selected the cases and sent them to an altitude for treatment; and the last three, Drs. Denison, Fisk, and myself are resident physicians who had no control over the selection of the cases, and had to make the best of the material we received, many of our patients having come on their own judgment, or on the advice of physicians unacquainted with the principles of climatology. This, probably, accounts for what the original records would show, that the quality of the cases treated by the last three observers was inferior; and, therefore, the gross results not as good as those of the first three.

TABLE I.

| Stage. | Number. | Per cent. | State of lungs before residence in Colorado. | Cured. | Greatly improved. | Improved. | Worse. | Died. | Total. |
|---|---|---|---|---|---|---|---|---|---|
| 1st | 62 | 43.97 | 25 had right lung alone affected. | 13 | 7 | 3 | — | 2 | 25 |
| | | | 21 had left lung alone affected. | 15 | 3 | — | — | 3 | 21 |
| | | | 16 had both lungs affected. | 8 | 4 | 1 | 1 | 2 | 16 |
| | | | Totals . . . . . . . | 36 | 14 | 4 | 1 | 7 | 62 |
| 2d and 3d | 79 | 56.02 | 30 had right lung alone in 2d and 3d stages. | 8 | 6 | 6 | 1 | 9 | 30 |
| | | | 5 had right lung in 2d and 3d stages, and the left in the 1st. | — | 1 | — | — | 4 | 5 |
| | | | 28 had left lung alone in 2d and 3d stages. | 2 | 5 | 8 | — | 13 | 28 |
| | | | 9 had left lung in 2d and 3d, and right in 1st stage. | — | 2 | 1 | — | 6 | 9 |
| | | | 7 had both lungs in 2d and 3d stages. | 1 | — | 1 | 1 | 4 | 7 |
| | | | Totals . . . . . . . | 47 | 28 | 20 | 3 | 43 | 141 |

| Stage. | Number. | Per cent. | State of lungs in 2d and 3d stages separately. | Cured. | Greatly improved. | Improved. | Worse. | Died. | Total. |
|---|---|---|---|---|---|---|---|---|---|
| 3d | 30 | 21.27 | 13 had right lung alone affected. | 1 | 3 | 3 | — | 6 | 13 |
| | | | 14 had left lung alone affected. | — | 5 | 1 | — | 8 | 14 |
| | | | 3 had both lungs affected. | — | — | 1 | — | 2 | 3 |
| | | | Totals . . . . . . . | 1 | 8 | 5 | — | 16 | 30 |
| 2d | 49 | 34.75 | 22 had right lung alone affected. | 7 | 4 | 3 | 1 | 7 | 22 |
| | | | 22 had left lung alone affected. | 2 | 2 | 8 | — | 10 | 22 |
| | | | 5 had both lungs affected. | 1 | — | — | 1 | 3 | 5 |
| | | | Totals . . . . . . . | 10 | 6 | 11 | 2 | 20 | 49 |

TABLE II.—*Elevated climates* (4500 *feet and upwards.*)

ALL STAGES.

| | Reported by | No. of cases. | Cured. | Benefited. | Where treated. |
|---|---|---|---|---|---|
| 1. | Dr. Herman Weber, | 106 | 36 per cent. | 75 per cent. | Swiss Alps. |
| 2. | Dr. Theo. Williams, | 141 | 41 " | 75 " | " |
| 3. | Dr. H. A. Johnson, | 19 | 37 " | 79 " | Colorado. |
| 4. | Dr. Charles Denison, | 202 | 37 " | 80 " | " |
| 5. | Dr. S. A. Fisk, | 100 | 35 " | 67 " | " |
| 6. | Dr. S. E. Solly, | 141 | 33½ " | 67½ " | " |

FIRST STAGE.

| | Reported by | P. c. of cases. | Cured. | Benefited. | Where treated. |
|---|---|---|---|---|---|
| 1. | Dr. Herman Weber, | 66 | 51½ per cent. | 64 per cent. | Swiss Alps. |
| 2. | Dr. Theo. Williams, | 65 | 63 " | 90 " | " |
| 3. | Dr. H. A. Johnson, | 47 | 44½ " | 78 " | Colorado. |
| 4. | Dr. Charles Denison, | 37 | 75 " | 92 " | " |
| 5. | Dr. S. A. Fisk, | 42 | 66 " | 90½ " | " |
| 6. | Dr. S. E. Solly, | 44 | 58 " | 87 " | " |

1. Dr. Herman Weber, of London, reported, in the London "Lancet," May 12th, 1888, 106 cases that were sent by him to the Swiss Alps. They were of a selected class only in the sense that they belonged to the well-to-do classes, and were, therefore, persons who were able, and generally intelligent enough, to take care of themselves, and had previously been in good condition, and were chosen as suitable cases for altitude treatment.

2. Dr. C. Theodore Williams, of London, reported on May 8th, 1888, to the Royal Medico-Chirurgical Society of London (Vol. 71 of the "Transactions"), the results, etc., of the treatment at an altitude of 141 cases, all but four having been resident in the high Swiss Alps. The four had been in Colorado, New Mexico, and the South African Highlands. They were all of a similar class to Dr. Weber's patients, and carefully selected for the climate they were sent to.

3. The late Dr. Hosmer A. Johnson, of Chicago, reported to the American Climatological Association, September, 1890, 25 cases of phthisis that went to the Western Country. Of these I found that 18 came to Colorado, and 1 to Western Kansas, where the climate and elevation are very similar, the remaining 6 going to California. The exact stage of the disease was not given, but the descriptions are such as to justify their separation in the way given here. The social condition of the patients, I believe, was favorable.

4. Dr. Charles Denison, of Denver, in his work entitled "Rocky Mountain Health Resorts" (published in 1881 by Houghton, Mifflin & Co., Boston), reports on 202 cases treated by him in Colorado. He did not put any under the head of cured, but of much improved he reports 47 per cent. He estimates, however, that a deduction of 10 per cent. should be made from this to arrive at the approximate number of cured; and as this brings it in close resemblance to the other figures, it is probably near the truth; the unusually high percentage of benefited in the cases of Drs. Denison and Johnson are proba-

bly due to the subsequent histories of the cases not having been traced for as long a period as by the other observers.

5. Dr. S. A. Fisk, of Denver, in his address as president of the Colorado State Medical Society, reported in June, 1889 (see "Transactions"), 100 cases treated by him in Colorado. Like Dr. Denison, he does not give any as cured, but as much improved. From recent correspondence with him, I learn he estimates that a deduction of 15 per cent. from his 50 per cent. of those much improved would give about the proportion of cures.

TEMPERAMENT.—Looking carefully through the original notes of my 141 cases, and recalling mental pictures of each individual, their mental and physical pêculiarities, and the tendencies exhibited in their reactions to their surroundings, I find it comparatively easy to range them under the several temperaments which I have described in a paper read by me before the Denver Medical Association ("Journal of the American Medical Association," June 8, 1889). In order to explain my views upon temperament, I quote the following extracts from this article:—

"The ancient writers upon our art endeavored to explain these different underlying forces as due to certain humors; the history and description of their views is too well known for me to recapitulate them here. We moderns have accepted and must still accept much of their nomenclature, but we have rejected their explanations of the causes of the several temperaments, without seriously concerning ourselves with finding new ones. A recent writer in 'The Medical Record' (Aug. 4, 1888), in reviewing two essays of Hellwig upon temperament, says: 'Physicians learn, consciously or unconsciously, to recognize temperamental differences, and to suit both manner and medicine to the fact.' He further goes on to remark that the best definition has been given by Muller, who essentially describes temperament as 'the reaction of the individual to his environment.' In the same article Hellwig's tabular definition of temperament is presented, which is founded on the view that it is the varying strength of the reception of an impression and of the reaction of the individual to it that distinguishes the temperament.

HELLWIG'S TABLE.

| Temperament. | Reception. | Reaction. |
|---|---|---|
| Choleric. | Strong. | Strong. |
| Sanguineous. | Strong. | Feeble. |
| Melancholic. | Feeble. | Strong. |
| Lymphatic. | Feeble. | Feeble. |

"Darwin Hudson (Johnson's Encyclopædia) defines temperament 'As a mixture or tempering of the essential elements of the body, whose excess or variable quantity determines the chief characteristics of mind or physique.'

"What are the essential elements of the body? In the various definitions of temperament that are to be found there is always a reference to some such undefined factors as being at the foundation of the problem of temperament. Before we can build up any reasonable scheme of temperament we must clear off the wrappings and expose the root of the matter; in short, we must explain what is meant by the essential elements of the body.

"What is the essential quality of living matter; its power of renewal, that is, nutrition? When a portion of elementary living matter, which we term protoplasm, becomes separate and individual, as in an amœba, what is the essential quality of its individuality? It is its capacity to receive an impression from, and its power to react to, its environment. This quality is exercised through nerve force. It is true that we cannot detect nerve structure, as we know it, in the dawning life of the individual, but though the localized and visible machinery, which we term nerve-tissue, is not apparent, the real essential element of nerve force is undoubtedly diffused through the general mass of the individualized protoplasm, conferring on it the capacity to receive impressions, at least in an elementary manner.

"The first reaction of the separate piece of protoplasm to the reception of an impression received from its environment would appear to be the formation of a cell wall, whereby it reacts to external pressure by hardening itself superficially. Thus it defines its individuality and protects itself in the exercise of its essential function of nutrition, which function consists of the importing of raw material for food, and the manufacture of it into the structure of the individual. The first evidences of a nervous system show that it is used to receive and react to impressions made from without; the passing food is drawn in when reflex action is developed by the impression received from without.

"Thus we see that a living individual has two essential qualities, nutrition, whereby it lives, and innervation, whereby it individualizes itself, both essential to each other.

"The evolution of nutrition is briefly thus: Simple absorption and assimilation of food by the whole mass of protoplasm and the general excretion of its waste; then the localization of digestion in a stomach; next the carrying of the digested nutriment to remote parts by lymphatic vessels; then this circulatory process elaborated into a vascular system, with its heart or pump. Then a portion of the clear, white lymph gradually changed into red blood, then the chemical changes producing bodily heat. Thus the circulatory system of nutrition passes from a lymphatic, cold-blooded stage to the warm, red-blooded form of the mammal.

"The nervous system beginning in the sympathetic form, next the motor, then the sensory up to its highest elaboration in the brain of man, with its power of receiving impressions without bodily contact, by means of thought.

"Through innervation comes the power of reception of impressions made upon the individual.

"Through nutrition the power of reacting to such impressions, the latter being exhibited immediately through its circulatory system, which in man in its most important form, with respect to the power of reaction, is sanguineous.

"The essential difference in reception is in speed, and, therefore, the two chief divisions are into quick and slow. Quick reception may be best called 'nervous;' slow, 'phlegmatic.'

"The essential difference in reaction is in strength, therefore the chief division is into strong and weak. Strong reaction may be called 'sanguineous;' weak, 'lymphatic.'

"Thus temperaments should be primarily divided into those of quick reception, nervous; and those of slow, phlegmatic; those of strong reaction, sanguineous, and those of weak, lymphatic. But as each individual has both qualities of reception and reaction, so each quality should be expressed in the name of each temperament; therefore, taking these four in their main varieties of combination, we have eight different temperaments, the first of the names signifying the most pronounced of the two qualities as exhibited in the temperament.

| Temperament. | Reception. | Reaction. |
|---|---|---|
| 1. Nervo-sanguineous. | Quick. | Strong. |
| 2. Nervo-lymphatic. | Quick. | Weak. |
| 3. Phlegmo-sanguineous. | Slow. | Strong. |
| 4. Phlegmo-lymphatic. | Slow. | Weak. |
| 5. Sanguineo-nervous. | Quick. | Strong. |
| 6. Sanguineo-phlegmatic. | Slow. | Strong. |
| 7. Lympho-nervous. | Quick. | Weak. |
| 8. Lympho-phlegmatic. | Weak. | Weak. |

"No mention has been made of a normal or balanced temperament, as it was styled by Galen, it being an ideal not met with in real life. The nervo-sanguineous, or perhaps rather the sanguineo-nervous, would be nearer to it, that is with respect to quality, though it may not be in regard to quantity. That is, it is normal when the reception of an impression is in proper degree to the cause. For instance, a normally nervous person, when angered with sufficient cause, would not let his passion run riot, but would fit it to the occasion, while the abnormally nervous person is thrown into a passion by a trifle or is over-excited by trifles. The normally sanguineous individual, when affected by disease or injury, responds by vascular excitement and perhaps even inflammation, sufficient to defend his tissue or repair the damage, and no more. The phlegmatic temperament is always behindhand in its work of reception, and is evidently a type of arrested evolution at the stage when the sympathetic and motor systems are well developed and the sensory yet incomplete.

"The lymphatic temperament always lags behind in reacting to the stimulus conveyed to it through the nervous system, and may be looked upon as a type of arrested evolution at a stage when the change from white, clear, cold lymph to red, thick, hot blood is going on, but is not fully accomplished.

"An individual born with a certain temperament can undoubtedly modify it considerably by force of will and education. Circumstance or disease will also modify, and permanently or temporarily change the relative force of its phenomena. Change of climate often exaggerates or diminishes certain of its manifestations. As physicians the impression made upon temperament by disease is what chiefly concerns us. The reception of the impression made by the invasion of the body by disease is quick or slow, excited or calm, according to whether the individual is of the nervous or phlegmatic, and reaction is strong or weak as he is of the sanguineous or lymphatic temperament. Knowing the temperamental type of a patient, we can explain and allow for many of the incongruities of pulse, temperature, and nervous phenomena that we meet with.

"How are we to diagnose the temperament? Is the individual plethoric or anæmic in appearance? Finely chiseled in feature and small-boned, or coarse in outline and large-boned? Is he mentally quick or slow in conversation, and nervous or phlegmatic under our examination? Is his view of his case exaggerated in its despondency or cheerfulness? Does his history show a tendency to inflammation or to passive congestion? Is he inclined to fever? Does he react quickly to cold? Are his feet usually warm? These, suggestively, are some of the observations and questions which will give us the material for classifying a patient's temperament.

"The old classification of temperaments into hot and cold suggests the sanguineous or hot and full-blooded, the lymphatic the cold and thin-blooded. The old forms of dry and moist are suggestive of the nervous and phlegmatic, high nerve tension and dryness being necessarily allied, while moisture and low tension are equally inseparable.

"If Hellwig's table and the one herewith presented are compared, the first four temperaments are identical except in name. The nomenclature suggested is somewhat cumbersome, and if it could be lightened without losing the advantage of the name conveying the meaning and the dual nature of the temperament, it would doubtless be better. The chief advantage, if the previous premises are accepted, is that the meaning and the name are linked together, instead of, as in other titles, the meaning being open to various interpretations and merely suggestive of ancient physiological errors and not of the underlying and causative physical facts.

"These definitions admit of subdivisions if needed to describe particular temperamental peculiarities, as in the nervous system when the mental, motor or sympathetic systems appear most prominent in excess or deficiency of action; or with respect to special phenomena of nutrition as exhibited in the working of a special organ, as the liver, stomach, etc. All these, however, will be found to ultimately range themselves under the divisions here given. Diatheses which are pathological temperaments, and excesses or deficiencies of function dependent upon pathological changes, are not here considered."

Following the classification thus laid down, I find that the 141 cases range themselves with respect to their temperamental peculiarities, as follows: nervo-sanguineous, 31; sanguineo-nervous, 29; nerve lymphatic, 25; lympho-nervous, 19; phlegmo-sanguineous, 13; sanguineo-lymphatic, 3; lympho-phlegmatic, 12. Grouping together all those with a nervous tendency, we find that there are 104 such cases, that is about 74 per cent., while of the phlegmatic there are but 37, or 26 per cent. Taking now all the sanguineous, which term may be misleading owing to its old meaning, and therefore may, perhaps, better be spoken of here as those with a *strong physique*, we find that there were 84 (about 60 per cent.); while of the lymphatic, which again, owing to the old application of the term, we may perhaps better distinguish as having a *weak physique*, there were 59, which is about 41 per cent. of the whole number. Dividing them still further, we find that, taking those of a nervous temperament and a strong physique, there were 60, that is 42½ per cent.; while of the nervous, with a weak physique, there were 44, about 31 per cent.; while of the phlegmatic temperament 22 (15½ per cent.) possessed a strong physique, and 15 (that is 10½ per cent.) had a weak one. It would, therefore, appear that of the 141 persons who had phthisis, the greatest number were of a nervous temperament; and that there were more of a strong than a weak physique. It is impossible to show whether the nervous and strong are more subject to consumption than the phlegmatic and weak, without knowing what is the normal percentage of the various temperaments among the whole population from whom these people came.

This, however, we may remember, that, among the American people to whom most of the persons belonged, the nervous temperament is believed to predominate; but this throws no light upon whether those of strong or weak physique are most open to attack by phthisis. It may be there are more people of a strong physique than a weak, in the population generally. We, however, must leave this interesting question for more extended investigation, and turn to the influence of temperament and physique upon the course of the disease.

This is exhibited in the following table:—

TABLE III.—*Proportion of cured and benefited in the different temperaments.*

IN ALL STAGES OF THE DISEASE.

| Temperament. | Physique. | Cured. | Benefited. | Cured. | Benefited. |
|---|---|---|---|---|---|
| Phlegmatic, | Strong, | 59 per cent. | 86 per cent. | 41 per cent. | 70 per cent. |
| " | Weak, | 13 " | 47 " | | |
| Nervous, | Strong, | 45 per cent. | 68 per cent. | 37 " | 60 " |
| " | Weak, | 18 " | 62 " | | |
| Strong physique, both nervous and phlegmatic | | | | 49 " | 84 " |
| Weak physique, both nervous and phlegmatic | | | | 19 " | 57 " |

We find from this table that the greatest number cured and benefited are among those possessing a strong physique irrespective of their temperament, while contrasting temperaments the phlegmatic are more benefited than the nervous, providing they each possess a strong physique; but on the other hand when the physique is poor those with a nervous temperament show a greater power of resistance to the disease than the phlegmatic.

WISDOM AND UNWISDOM.—To find out in a measure what amount of influence the prudence and common sense of the individual exerted over the course of the disease, I went carefully over the records, and marked down each person as wise and unwise in the matter of taking care of himself, and then found the percentage of the 141 cases. 86, *i. e.*, 61 per cent., were wise, and 55, that is 39 per cent., were unwise. I then proceeded to find out the percentage of wisdom in the various temperaments, and these are shown in the appended table.

TABLE IV.—*The proportion of wisdom among the various temperaments.*

| | | Wise. | Wise. |
|---|---|---|---|
| Phlegmatic . . . | Strong | 82 per cent. | 76 per cent. |
| | Weak | 53 " | |
| Nervous . . . . | Strong | 62 per cent. | 60 " |
| | Weak | 57 " | |
| Strong, both nervous and phlegmatic . . | | | 67 " |
| Weak, both nervous and phlegmatic . . | | | 56 " |

From this it appears that the greatest amount of wisdom was among those of a phlegmatic temperament, and there was more among the strong than the weak, and that therefore those of a phlegmatic temperament and a strong physique were by far the most apt to show wisdom.

Finally, I found the percentages of cured and benefited among the wise and unwise in the first stage cases only, then in the second and third stages combined, and, lastly, in all stages together, heading each table with the average percentage for the total 141 cases, so as to show the relative effect of wisdom upon the results.

TABLE V.—*Proportion of cured and benefited among wise and unwise in the different stages.*

| | | Cured. | Benefited. |
|---|---|---|---|
| 1st stage . . . | Total 141 cases . . | 58 per cent. | 87 per cent. |
| | Wise cases . . . | 68 " | 91 " |
| | Unwise cases . . . | 31 " | 75 " |
| 2d and 3d stages combined . . | Total 141 cases . . | 14 per cent. | 52 per cent. |
| | Wise cases . . . | 21 " | 59 " |
| | Unwise cases . . . | 2 " | 41 " |
| All stages combined . . . | Total 141 cases . . | 33 per cent. | 68 per cent. |
| | Wise cases . . . | 42 " | 77 " |
| | Unwise cases . . . | 11 " | 51 " |

From these tables it would appear that among the wise the percentage of cures in all stages was a third more than the average, and nearly four times as many as among the unwise. The percentage of benefited was similarly higher, though in a less degree. Among the first stage cases a like difference prevailed, but in both the cured and benefited in a degree about 50 per cent. less; while, taking second and third stages, and omitting the first stage cases, the difference was similar, but among the cures very much more marked in this than in the other tables. This would indicate that, although imprudence was a bad thing in an early stage, it was far more serious in an advanced one, in which an act of folly was often irremediable. The superiority of results among the prudent serves to explain in a measure the better reports obtained from sanatariums than those from open resorts, which is demonstrated by my tables in the article upon "Climate" already referred to, for doubtless the discipline and example enforced in the sanatariums turn many of the would-be unwise into the class of wise invalids.

CONCLUSIONS.—If, as would appear from the comparison made with the other reports of cases treated in high climates, that these 141 cases represent the average qualities of such cases, then the truths indicated by these inquiries are that the qualities which most aid the consumptive in recovery are, first, strength; second, wisdom; and third, equanimity.

*Therefore, the essentials of the general treatment of phthisis are to preserve and strengthen the physique, enforce prudence, and induce placidity.*

# MINERAL SPRINGS AND CLIMATE OF GEORGIA.

By T. S. HOPKINS, M.D.,
OF THOMASVILLE, GA.

THE interest manifested by the medical profession of our country for several years in the subject of mineral springs has induced me to investigate some of the mineral springs of Georgia. If reports be true, Georgia can boast of more mineral springs than any other State in the Union. In my summer travels through the mountains I hear of a mineral spring at almost every stopping-place, each and all claiming to possess panaceal powers. From the large number reported I select those only whose therapeutic properties, from personal experience and observation, I can honestly and cheerfully indorse.

These are the "Bowden Lithia Springs," in Douglas County, Georgia, twenty miles from the city of Atlanta, on the Georgia Pacific Railroad. I was attracted to these springs by the analysis of the water sent to me, on account of the amount of bromine and lithia it contained. Several analyses of the water had been made by chemists in Georgia; but the owner of the springs was advised to submit the water to Professor Doremus, of New York, for analysis. In my presence a ten-gallon cask of it was filled directly from the springs, corked, sealed, and shipped to Prof. Doremus. The result of his analysis is given on p. 98.

Within the last two months I have examined the published analyses of more than two hundred and fifty mineral springs in America and abroad, and find that but one in America (Congress Spring, Saratoga) claims to contain a larger amount of bromine, and that not one in Europe or America contains anything like the amount of lithia found in the water of this spring. I have stated that I was attracted to these springs by the amount of bromine and lithia which the water contained. Anorexia, insomnia, frequent attacks of diarrhœa, and prostatic irritation were my troubles. A sojourn of a few weeks brought me relief. My appetite returned, my sleep was long and refreshing, my diarrhœa ceased, and my prostatic irritation was relieved. During my sojourn at these springs, Dr. W. H. Whitehead, the courteous physician in charge, was kind enough to furnish me not only with the names of the large number of cases under treatment, but with a history of each case. This enabled me to interview his cases and to ascertain the remedial effect of the water in each individual case. In lithiasis, and cases of uricæmia as defined by Professor Flint, chronic cystitis, and in one case of diabetes, the effect of the water was truly wonderful. My investigations at these springs lead me to believe that in the above-mentioned "troubles"—in fact, in all curable diseases of the genito-urinary organs—no mineral water in the world can be more highly recommended than this. We are aware that mineral waters often win their reputation when used as adjuncts to medical treatment; hence I have selected only such cases as have been benefited by the water alone. I found at these springs a large number of

---

ANALYSIS OF "BROMINE LITHIA SPRINGS."

| | | |
|---|---|---|
| Calcium bicarbonate | 17.247 | grains. |
| Magnesium bicarbonate | 2.874 | " |
| Lithium bicarbonate | 4.447 | " |
| Ferrous bicarbonate | 0.216 | " |
| Sodium chloride | 121.783 | " |
| Sodium sulphate | 8.032 | " |
| Potassium sulphate | 1.466 | " |
| Aluminium sulphate | 0.530 | " |
| Strontium sulphate | 1.226 | " |
| Calcium sulphate | 12.153 | " |
| Magnesium bromide | 1.732 | " |
| Silicic acid | 1.263 | " |
| Iodine, Manganese, Phosphoric acid, Boracic acid | Traces. | |
| Rubidium—Traces by spectroscopic analysis. | | |
| Loss on ignition | 5.749 | " |
| Total solid residue by calculation | 178.718 | " |
| Total solids dried at 130° C. | 171.925 | " |
| Carbonic acid in bicarbonates | 9.911 | " |
| | 181.836 | grains. |

people from New Orleans and other sections of the Mississippi Valley, with all sorts of complaints—"dyspepsia," "nervous prostration," "overwork," "bilious troubles," etc., all of which I was disposed to include under the head of malarial cachexia—who found great relief from the use of the waters. My observations and investigations at these springs are sufficient to warrant me in believing and predicting that ere long they will become a famous resort—the Saratoga of the South.

These springs—for there are two of them, differing only as to the amount of bromine and lithia which the waters contain—have a very decided climatic advantage over any similar springs in more northern latitudes. They are in a climate where the invalid or those seeking the benefits of appropriate mineral waters can find it at all seasons of the year. At these springs they will find—

| | |
|---|---|
| In Spring, a mean temperature of . . . . . | 57° |
| " Summer, " " " . . . . . | 73° |
| " Autumn, " " " . . . . . | 57° |
| " Winter, " " " . . . . . | 48° |

I am satisfied that we have in our own country mineral springs whose waters contain therapeutic elements equal to, if not superior to, the most famous in Europe. There is one thing, however, lacking at the "water resorts" of America. So far back as the reign of Henry the Fourth, of France, the necessity of controlling the use of mineral waters, in order to prove their therapeutic value, induced the government to establish rules to this end at all the famous watering-places in the kingdom. The visitors at all the watering-places had to subject themselves to the rules or leave. The physician in charge, after an examination, prescribed the use of the water. When such rules are established and enforced at the mineral springs of America, thousands of our people who annually visit Carlsbad, Falkenstein, and other resorts in Europe will be content to remain at home, seeking and finding relief from American mineral waters, saving thousands of dollars of expense and thousands of miles of travel. These rules, and not the therapeutic superiority of European springs over those of America, have won for the former the celebrity to which they have attained. Such rules enforced at our American watering-places would very soon establish the fact that the waters contain therapeutic elements unsurpassed by any in the world.

The hotel accommodations at "Lithia Springs" are all that could be desired. The "Sweet Water Park Hotel," at an altitude of twelve hundred feet above the sea-level, contains all the modern improvements of our first-class hotels, differing from many, in no way superior, in its very moderate charges. There are several smaller hotels at these springs, where good board can be had for thirty dollars per month. All the fixtures and appliances for the medicinal use of the water at our most fashionable "watering-places" will be found at these springs. The analysis of Prof. Doremus is of the water from the "Bromine Lithia Spring," comparatively a new spring. The following analysis by Prof. Pratt is of the "Lithia Spring," long a popular resort for those suffering from genito-urinary troubles:—

ANALYSIS OF THE "LITHIA SPRING."

One imperial gallon contains:—

| | | |
|---|---|---|
| Solid contents | 181.248 | grains. |
| Carbonic acid as bicarbonate | 9.847 | " |
| | 191.095 | " |
| Calcium bicarbonate | 14.184 | grains. |
| Magnesium bicarbonate | 10.321 | " |
| Lithium bicarbonate | 2.848 | " |
| Ferric bicarbonate | 0.215 | " |
| Potassic bicarbonate | 3.363 | " |
| Sodium sulphate | 16.250 | " |
| Aluminium sulphate | 1.326 | " |
| Strontium sulphate | 1.022 | " |
| Magnesium sulphate | 4.408 | " |
| Calcium phosphate | 0.639 | " |
| Sodium chloride | 133.708 | " |
| Magnesium bromide | 1.691 | " |
| Silicic acid | 1.120 | " |
| Iodine, Fluorine, Manganesium, Organic matter | Traces. | |
| Total contents | 191.093 | grains. |
| Specific gravity | 1.004 | |

In presenting to the public the therapeutic value of these springs, I would say that I have no intention or desire to depreciate or detract from the claims of any others. My indorsement of them is based upon actual individual test and close scrutiny and observation of tests in others.

In presenting the claims of these springs to the public, I feel that I should say something of the climate of Georgia. By reference to our temperature map, I find that eight of the nine temperature belts in the United States are represented in Georgia. So varied is the climate that one in search of health, who has determined to abandon drugs, and put his trust in climato-therapeutics, can find a climate within the confines of the State adapted to almost any physical ailment to which human flesh is heir. If he require a seaboard locality, with sea-bathing, he can find it all along the Atlantic coast on the sea islands, with first-class accommodations, equal to any on the coast of New Jersey. Should he visit the Island of St. Simon's, seven miles from the city of Brunswick, and stop at the "Hotel St. Simon's," he will imagine himself at Long Branch. If he require a drier climate, he can, in a few hours, from an altitude of eight or ten feet upon the sea-level and a relative humidity of 77, reach the interior pine-forests at Thomasville, with an altitude of 330 feet and a relative humidity of 65, and the following conditions of temperature.

| | | | |
|---|---|---|---|
| Spring, a mean | temperature of | . . . . . | 67.78° |
| Summer | " | " . . . . . | 80.44° |
| Autumn | " | " . . . . . | 67.90° |
| Winter | " | " . . . . . | 54.50° |
| Annual | " | " . . . . . | 67.75° |

A comparison of this temperature report with that of Lithia Springs, about two hundred miles due north, shows the following differences:—

| | |
|---|---|
| Spring | 10.78° |
| Summer | 7.44° |
| Autumn | 10.90° |
| Winter | 6.50° |

In Spring he may ascend north, from a temperature of 70° in South Georgia, to a temperature in North Georgia of 58°; in summer, from 81° to 72°; in autumn, from 69° to 56°; in winter, from 56° to 40° and below. I am indebted to Professor R. J. Redding, State Meteorologist, for the following Table of Temperature and Rainfall in Georgia from 1878 to 1883:—

| | State. | North Georgia. | Middle Georgia. | Northwest Georgia. | East Georgia. | Southwest Georgia. |
|---|---|---|---|---|---|---|
| **Temperature.** | | | | | | |
| Mean annual per State | 65.1° | 59.2° | 63.5° | 68.1° | 66.1° | 68.9° |
| Spring | 63.8 | 58.8 | 63.0 | 68.0 | 65.7 | 68.3 |
| Summer | 79.7 | 75.3 | 79.2 | 81.1 | 81.4 | 81.4 |
| Autumn | 66.0 | 59.9 | 64.1 | 69.3 | 66.1 | 70.3 |
| Winter | 50.1 | 42.8 | 47.2 | 54.0 | 51.3 | 55.6 |
| Summer aver. above winter | 29.6 | 32.5 | 32.0 | 27.1 | 30.1 | 25.8 |
| **Average Rainfall (inches).** | | | | | | |
| Annual | 49.3 | 60.2 | 49.7 | 47.3 | 41.4 | 47.8 |
| Spring | 12.4 | 15.5 | 13.7 | 12.5 | 10.3 | 10.0 |
| Summer | 13.4 | 13.6 | 12.6 | 14.5 | 12.3 | 14.2 |
| Autumn | 11.0 | 12.7 | 9.0 | 9.7 | 9.6 | 14.1 |
| Winter | 12.4 | 18.4 | 14.5 | 10.6 | 9.2 | 9.5 |
| **Average Elevation above Sea Level.** | | | | | | |
| | 1600 | 1700 | 750 | 400 | 125 | 100 |

This table elucidates what I have said of the varied climate of the State. Those who may be in search of altitude, so often beneficial in pulmonic disease, and especially so in hemorrhagic phthisis (according to my observation), can find many localities in the State, at from fifteen hundred to over three thousand feet. Should one desire to ascend the mountains that he may have a view of the beautiful and picturesque surrounding country, he can do so in Turner County, at an altitude of over five thousand feet.

It will be seen, from what I have written, that a mean temperature of from 40° to 70° can be found in Georgia between a range of latitude of only four-and-a-half degrees. I am now, as I ever have been, strictly speaking, a national man. Neither "State pride" nor the hope of local benefits could induce me to misrepresent any locality which I felt assured would benefit the sick, whether it be on the banks of the St. Lawrence or the Rio Grande, the coast of the Pacific or that of the Atlantic.

It is gratifying to me, in concluding this article, to know that I have the indorsement for what I have said of the climate from a distinguished Union soldier, who, during the late civil war, was afforded an opportunity of seeing Georgia from the mountains to the seaboard. General Dodge, in "Farm and Factory," says of Georgia:—

"It is a healthy and beautiful land, redolent of flowers and surfeited with wild fruits, while cultivated fruits of the temperate and sub-tropical zones grow profusely with little care in cultivation.

"The dweller in a forest cabin can subsist in luxury on fish and fruits, with venison, turkey, or duck upon his table daily.

"The climate is so mild that his house could be constructed with a few days' labor in the primeval forest. Life is rich and full and joyous in this sunny land."

# RACIAL CHARACTERISTICS IN DISEASE.

By J. WELLINGTON BYERS, M.D.

CHARLOTTE, N. C.

MODERN science, fortified by the luminous theory of evolution as exemplified in the laws and processes of heredity, establishes the fact that an exact and thorough conception of all the predisposing conditions of disease is indispensable to the ultimate perfection of medicine and prophylaxis. It is among these important conditions that we must search and discover those powerful contributory influences which control the etiology, history, and sequelæ of the entire series of morbid phenomena to which man is liable. That they are invariable and necessary antecedents to the occurrence of all specific pathogenic agents, without whose presence they could neither reach, invade, nor successfully attack the organism, is now very generally and conclusively conceded.

In making an examination of these morbific conditions we are confronted with the fact that they uniformly consist of either an impaired or lessened quality of vital resistance or they induce this state in the system. In other words, they produce a condition of susceptibility and render the system liable to the encroachment of agents from which it otherwise would be exempt.

This is true of the subjective conditions or factors of race, nation, sex, age, also those of external environment, such as climate, class, habitation, occupation, soil, and geographical position. The lower the ethnic form, the higher the susceptibility; the nearer the extremes of life, the more fatal the disease; the warmer the climate, the shorter the life; the lower the class, the greater number of deaths. Man is not born, does not live, does not suffer, does not die the same at all points of the earth. Birth, life, disease, and death, all vary with race and nation, all are modified by climate, soil, and class. (Boudin.)

That there are peculiarities or characteristics of mind and body associated with each particular race and people is generally recognized as a fact, though that these differences continue to exist and manifest themselves by differences in susceptibility and clinical events, is not so freely admitted, though an equally obvious conclusion. When Velpeau, upon one occasion, was twitted by some English visitors in regard to the excessive mortality of French as compared to English hospitals, he is reported to have replied, "Yes, but the flesh of an Englishman is not the flesh of a Frenchman." This remark illustrates a very important fact in the history of living creatures—namely, there are gradations and differences in their conduct towards disease-agents, when no apparent differences exist in their grosser physiological features.

There is an ancient and familiar adage that affirms "blood will tell," which has been recognized in matters of social, moral, and intellectual character, though, as applied to the physical attributes of man, it has received only a limited amount of assent. History demonstrates at all times, for all people, that they occupy different grades and planes of intellectual, moral, and physical culture, and development; that some are strong, robust, and progressive, while others are weak, ignorant, and retrogressive. Volney says that no Eastern race has ever shown the power of progress or the power of resistance. Their premature development carries with it an early decline which is manifested in their want of nervous and muscular power.

In the social condition there is always an intimate relation existing between the bulwarks of society, morality, knowledge, and health. This is true to such an extent that whenever any race or collection of people sinks below their natural or normal plane in intellect or morals there invariably follows a corresponding decline in their general physical condition and manhood. This ensues in every instance, no matter whether the infirmity comes from choice or force. There follow a deterioration and degradation in their vitality and longevity. The social condition carries with its establishment obligations and responsibilities of a moral and intellectual nature which can neither be violated nor disregarded without incurring corresponding damage of health and death. Moral depravity involves as correlatives intemperance, crime, excesses of all sorts, sensuousness, poverty, hunger, and physical degeneration. Mental penury fosters superstition, prejudice, ignorance; and invites self-neglect, abuse of the laws of sanitation; and produces physical defect and the predisposing conditions of disease. The English people, during the Middle Ages, relapsed into this condition of moral and mental degradation, their average duration of life reached only eighteen years, and their mortality rose as high as eighty deaths to the thousand living population. No race demonstrates the direful consequences of moral and intellectual inferiority more positive than the negro of the Southern States. Beginning with a naturally feeble resistance and a large amount of vulnerability for disease causes, they have, during a period of a quarter of a century, succeeded by an utter disregard of sanative, moral and mental duties in producing a physical degeneration, morbidity, and mortuary rates unparalleled in the history of mankind. Their sick and death-rates in all the centres of population, where they constitute a contingent, and where the means and facilities for vice, sensuousness and intemperance are multiplied, are more than twice those of the white associated with them. This finds no explanation in environment, but it must be taken as the consequence of an inherent feebleness of vitality and want of resistant powers. The same or worse conditions are found in the American Indian, who, beginning with markedly robust constitution, has succeeded in bringing about a physical defect appalling to consider.

These instances in the history of the black and yellow races are quite sufficient, and afford a striking example of the important interdependence which subsists between class and social condition. They indicate that while environment possesses powerful influences in the etiology and role of disease, still there are qualities which exist by virtue of race, which rise or fall in comparison to these, and that there is a tyranny of organization that no circumstance nor condition can suppress or subvert.

The evidence then is this: Individuals, or classes of them, enter the struggle for existence forearmed with very varying and unequal degrees of heredity powers, as expressed in vital resistance. The inferior or feeble ones are handicapped from the start, and no amount of favorable conditions can render them equal to those that are above, and superior in the scale of beings. This difference is apparent all through the series of living things. One individual will undergo the most trying ordeals of sickness and mutilation, yet pass out comparatively sound and well; while another, in whom we can detect no imperfection or contrasts, will succumb early in an attack and die from the most trivial injury. This is true of the lower orders of life, since the cat, mouse, rat, pig, and dog all show differences of susceptibility and immunity among themselves, and also when compared one with another.

Beginning at the summit with the Caucasian race, as the expression and embodiment of all that is noblest, best, and highest in man, we may descend by degrees down to the lowly negro, who stands at the very bottom of the ethnic scale. At every step we perceive alterations in vitality and longevity which grow less and less, modified here by climate, there by class, and yonder by soil, habitation, and geographical situation. The Anglo-Saxon, living in his natural habitat of 45° in the Eastern, and 40° in the Western hemisphere, affords the best type of man's moral, intellectual, and physical perfection. Here it is that the race presents the smallest morbidity, the fewest number of deaths, and the greatest longevity of any race in the world. As it digresses from these natural limits it becomes less resistant, and shows shorter lives and earlier decline. The Hindoos of Caucasian origin, but exposed during countless generations to the depressing influences of a hot climate, poor diet, and repressive social conditions, have lost their primeval vigor, and a temperament is begotten which differs widely from that of all Europeans. The Duke of Argyll, in examining the principal races of people commonly called savage, points out that degraded races generally occupy ends of a continent or countries inaccessible and almost unfit for human habitation. He concludes that they do not go there from choice, but from necessity or force.

A gross comparison of the physiological characteristics of the white, yellow, and black races suggests a lower and higher form of organization. Variations in skin, hair, size, and shape of skull and face, while affording no basis for an explanation of the discrepancies shown in relation to susceptibility and immunity of disease, still lead to the surmise that there are finer or more subtle differences in the tissues or cells which do control and modify this phenomenon. The laws of descent and heredity apply with equal force to cell-life and to the life of the complex organism. The development of the cell occurs along the same line, and is governed by the same laws as the multi-cellular organism. They are constantly adapting themselves to alterations of environment, and they transmit these excellences to their offspring. There are conditions that exist in the life of the cells of the fluids and solids of the body, the character of which we now know very imperfectly, that possess a powerful influence over the health and destiny of the individual.

The limits of this article preclude the idea of their free discussion, but it may be stated that a number of diseases are sufficiently well understood to warrant the conclusion that it will soon be possible to estimate with considerable precision the exact dominion of racial influence upon disease. That we possess in this factor the source and explanation of the differences which exist between the several communities of mankind living under analogous circumstances of life, is indeed possible. As data accumulate and grow more reliable and accurate we shall be able to estimate how it is that "one is taken and another left," and understand the reason why the Ethiopian cannot change his skin. As an important agent among the predisposing conditions of disease that of race is pre-eminent. All that has been acquired, impressed, or altered in the organization of individuals during the course of their lives is preserved by generation, and transmitted to the new individuals of the race who descend from them. This law of the masses is true of the individual, and the laws of heredity and environment exert a powerful and peculiar sway over their destiny.

# ASHEVILLE, N. C., AND ITS CLIMATE.

**With some General Considerations upon the Climatic Treatment of Pulmonary Phthisis.**

By KARL VON RUCK, B.S., M.D.

Asheville is situated upon a hilly table-land at an elevation of 2350 feet, in the culmination of the Alleghany Mountains in western North Carolina, in the divergence of the Great Smoky Mountains and the Blue Ridge.

Completely surrounding this plateau of thirty miles in width, the Blue Ridge to the south, east, and northeast, and the Smoky Mountains to the west and northwest, are the projecting spurs and peaks of these ranges, with an elevation double and almost treble that of Asheville, and the meteorological conditions of the plateau are peculiarly influenced by these high mountain chains, in temperature, in the dryness and purity of its atmosphere, and in the amount of precipitation.

The rain-clouds, especially those approaching from a southerly direction, are saturated at a higher temperature than they meet on approaching and passing over these mountain ranges, and on that account precipitate their moisture before reaching the plateau ; at any rate, there is a difference of some fifteen or twenty inches of annual rain-fall, and from ten to twelve degrees in the relative humidity between places situated immediately in the mountains and Asheville, where the humidity is comparatively low, being from fifty to sixty degrees in winter, and from sixty to seventy degrees in summer.

The temperature is moderated in the winter season by the prevailing air-currents from the south, those during the warmer months coming, as a rule, from a northerly direction; which, together with the elevation, make the summer months cool and pleasant.

The mean temperature for the six months from May to October is sixty-five, with a mean maximum of seventy-six degrees. For the winter months the mean temperature is forty-nine and the mean maximum sixty degrees Fahrenheit.

The Asheville plateau is particularly known for the great amount of sunshine, especially in the winter months, which justly earned it the appellation of "The land of the sky."

During that season the clear and fair days averaged twenty-four, and in the summer months twenty-seven and one-half days, out of each mouth.

For an elevation of 2350 feet, and with a complete inclosure by high mountain chains of from four to over six thousand feet in height, the range of temperature and daily variations are also remarkable, the former being less than twenty degrees Fahrenheit, and the latter only three degrees in the summer, and five degrees in the winter months.

The per cent. of ozone in the air has now been recorded, daily, for nearly three years, and averages from fifty to seventy degrees of the possible amount. This is certainly an interesting and remarkable feature, when we consider that in many localities the amount is so small as to be scarcely appreciable. In a series of observations made by me in Ohio, I could not get a trace for weeks and scarcely an average of five per cent. for months together.

Upon this forest-covered plateau, surrounded by forest-clad mountains extending for hundreds of miles in some directions, the latter with few or no human habitations, without marshes or standing water, and the plateau too, having the advantage of the most perfect natural drainage, there is nothing to contaminate the air, which is particularly free from micro-organisms and impurities of any kind, so much so, that severe injuries and surgical wounds heal promptly, often without antiseptic measures, and the occurrence of consumption and malaria among the natives of the plateau is denied altogether by many of the oldest physicians, and certainly is of the rarest occurrence.

The soil is a peculiar mixture of clay, sand, mica, and iron. Little of it has ever been disturbed by man, being still covered by primitive forests of balsam, pine, oak, walnut, hickory, and almost every variety of timber.

The scenic effect, from any of the many rolling hills of the

Asheville plateau, is most beautiful, and cannot be appreciated except by the eye of the beholder. Quiet and peaceful in its immediate vicinity, it is grand in the more distant view of the majestic mountains and their towering peaks, which surround it on every side, causing involuntary wonder and reflection upon the terrific forces which at one time must have been active in producing such violent upheavals of the earth.

Ever new and different, even at short distances from points of observation, new valleys and new mountain peaks present themselves as surprises, and the walks and drives in all directions lure the spectator along; this being, indeed, sometimes of doubtful advantage to the sight-seeing invalid, who forgets his fatigue in his rapturous admiration of Nature's possibilities. The ever-changing smoky mist hovering upon the peaks, and about the mountains, the effect of the shadows cast both by clouds and adjoining pinnacles, the sunrises and gorgeous sunsets, must be seen to be appreciated, and the tourist feels well paid, when, after perhaps thousands of miles of fatiguing travel, he catches the first glimpse of these still indescribable scenes.

Asheville and its vicinity have been well and favorably known for half a century or more to the Southern people for its peculiar beauty and cool mountain air, and has been the popular summer resort of the South for health and rest before and since the war; and the difficulties of access, before the advent of railroad facilities, were unflinchingly overcome by the visitors in days of staging or horseback travel.

Its winter climate was, however, little sought or understood at these times, and it was not until Professor J. W. Gleitsmann, now of New York, established his sanitarium for consumptives here some twelve years ago, and through his writings called the attention of the profession to its advantages, and proved them by his excellent results, which are still among the best in phthisotherapeutics, that Northern physicians began to send many patients to Asheville for the winter.

Since that time Asheville has had a wonderful growth and development, and has become accessible by rail from all directions. Its population has steadily grown at a pace of increase of a thousand a year, and it is to-day the second city in population, and the first in popularity and importance, of North Carolina.

Many Northern people have since made it their home for health, pleasure, or business, and even a Vanderbilt felt justified in the expenditure of a number of millions of dollars to create here a home, surrounded by advantages that money elsewhere could not buy.

The public spirit of its citizens, infused with the ideas and enterprise of Northern people, has made it possible for Asheville to have every advantage of city improvements, among which are water-works with Hyat filters, a perfect system of sewerage, gas and electric light, electric street railways, and parks; while the General Government has shown its appreciation of Asheville's importance by the general erection of fine public buildings.

This enterprise is further manifest in the appropriation and approval by public vote this spring of a sum of six hundred and forty thousand dollars for street pavements and sidewalks; and there is perhaps no other city known in America, with a population of only twelve thousand, which has heretofore had the courage so to provide for one item of public improvement at one time.

This was, however, done largely, if not entirely, for the pleasure and comfort of the constantly increasing number of visitors, who seek Asheville for health and rest or recreation, the citizens feeling it their duty to offer them every comfort and advantage during their stay.

The facilities for the care of both well and sick are now ample, and constantly increasing with the demand.

Since the winter of 1889 and 1890, when so many guests had to leave Asheville for want of accommodation, the well-known Battery Park Hotel has made large additions to its rooms, and several new hotels have been built. Among these, deserve mention "The Hotel Belmont," formerly known as "Asheville White Sulphur Springs Hotel," which, although of recent erection, has been remodeled and enlarged to a capacity for three hundred guests. Of the large hotels it is the only brick structure, beautifully located upon sixty-five acres of level ground, with an adjoining wood park. Its sulphur and iron springs are well and popularly known to every visitor of Asheville and its vicinity. It is located some two and one-half miles from the railway station, and has a special electric railroad connecting with all trains and the street railways of the city. The ride from the station up the French Broad River Valley to the hotel is one of the prettiest around Asheville. It is to be permanently opened on June 15 of this year by Dr. J. W. Marshall, formerly of Green Springs, Ohio.

Another new hotel is the Kenilworth Inn, now in process of construction, located about two miles from the station. It will also be a first-class house, to be opened some time this summer or fall, with enough rooms furnished for one hundred and fifty guests; and large additions are contemplated in the future.

The Oakland Inn has been converted into an institution for nervous and other chronic diseases, and is under the professional management of a homœopathic physician, Dr. Neefus. It can accommodate some seventy-five guests.

The Winyah Sanitarium, my own special institution for lung and throat affections, is already well known to the profession. An addition of twenty-seven rooms was made last summer, and many other improvements were added, making its hotel and hygienic appointments as perfect as possible. It has a capacity for one hundred patients and guests.

Other large hotel enterprises are in contemplation, and there are, besides those mentioned, a number of commercial hotels doing a transient business. The city abounds in boarding-houses, and their prices for accommodations vary from thirty dollars per month up, according to the table and accommodations they afford.

Churches of all denominations, public and private schools, several colleges, and plenty of business opportunities, are as good as can be found in any growing Northern city, if not better. Houses are constantly being erected, and offered for rent furnished or unfurnished, and the chances for favorable and growing profitable investments in homes for such as wish to make their permanent residence here are very good indeed.

The climate which has made Asheville's growth possible is, however, not so well understood, especially by Northern people (even by the profession) as it should be, judging from the frequent inquiries I receive in regard thereto.

It is pre-eminently an all-year climate, and there is no part or season of the year which compels patients, still in a condition to derive benefit, to seek other localities.

Many Northern physicians seem to labor under the impression that, being located in a Southern State, it must of necessity be hot in the summer months, and that, on the other hand, almost tropical conditions of climate exist here in the winter—neither of which is the case.

Located in the mountains, as previously described, with an elevation of almost two thousand five hundred feet, the summers are delightfully cool. One sleeps under woollen blankets the year round. The atmosphere is dry and bracing; there are no standing waters, or marshes, and consequently no mosquitoes.

The absolute maximum of temperature, since I have had charge of the U. S. Signal Service Station, has only on two or three occasions reached 89° F.

During any of the summer months invalids may require light wraps and overcoats.

The winter months, while not warm, are not severely cold, and there are few days on which patients cannot be out of doors without being cumbersomely clad to protect them from cold.

Snow rarely falls. If it does, it melts away quickly under the sun temperature, which is greater here in proportion to the elevation.

As to the class of pulmonary patients who may expect benefit from Asheville's climate, the general rule applies that the earlier stages of chronic lung disease are the only ones amenable to climatic or any other kind of treatment, and, while exceptions occur, the further advanced the case, the less are the chances for permanent or even temporary results. Much depends, however, upon the patient himself.

Unfortunately, climate cannot do everything; especially can we not expect that it will atone for all the follies and indiscretions phthisical patients commit while they reside at climatic resorts.

Many come with the idea, and act upon it during their residence at such places, that with their arrival and breathing of "Asheville air" the improvement begins, and in so many weeks or months they must of necessity be cured.

Climate is only one of the means to favorable nutritive processes, and although we have many theories as to what particular factor or combination of factors are the essentials of a favorable climate, the outcome of such theorizing, if we want to be honest with ourselves, is always an admission that we really do not know much beyond the favorable influence upon the circulation produced by the elevation, and that relatively dry and pure air must of necessity be better than damp and bad air.

The empirical experience in results obtained at the one or the other resort will, in the future as in the past, govern physicians as to what particular place they send their patients to. Other things are, however, very important, too; and, in the first place, we know fatigue is one of the most injurious influences upon the consumptive.

Therefore, other things being equal, the climatic resort of easiest access is most desirable, and if the patient can step into a comfortable sleeper, and reach his destination in twelve or twenty-four hours, he is better advised if he is sent there than if we send him upon a journey of several days' or weeks' duration, possibly with a long stage-ride at the end of it.

The care, comfort, and accommodations which the patient finds at his destination are equally important, and not less so is the length of time he can remain, should he be found to be improving.

If the patient be scarcely rested from one journey, he should not be obliged to take another in a month or six weeks, unless he is still in so early a stage that the injurious consequences of fatigue are not likely to follow the necessary travel.

But few of the patients who arrive at climatic resorts are in such condition that this is the case.

The inhalation of irritating substances, especially dust and smoke, is also known to be injurious, and patients should be instructed to avoid residence upon the thoroughfares and business streets of climatic resorts where they are of necessity exposed to such injury.

The sheltering of their temporary residences from wind, and the presence there of shade and seats, and of piazzas with different exposures for rest out of doors, are equally important.[1]

Want of professional advice and oversight, which latter by no means implies prescriptions for drugs to be taken, is frequently the cause for non-improvement.

Many of the patients whom I see here for the first time outside of my institution consult me on account of some relapse, and at such first interview there is then, of course, no record or exact knowledge on my part as to the patient's condition on arrival or before the relapse, and a temporary attendance for the removal of or recovery from the present complication is all they seek; after which they again shift for themselves. If professional attention is needed at home, where they cannot recover, why should it be dispensed with at the place where a cure is to be accomplished?

Patients who come to a climatic resort, and who have at home been accustomed to comfortable, well-heated, and well-ventilated houses; to good, large, airy rooms; to good beds, and good food and plenty of it, often try to save in their expenses by putting up at comparatively cheap boarding-houses, and of course they cannot get on well when depriving themselves of almost everything but air, upon which alone the nutrition does not thrive. The conditions in these cheap places are frequently such that they favor relapses in many ways; but this is to some extent also true with residence at fashionable hotels, where the social demands, the tiresome toilets of ladies, and other temptations to indiscretions, may become, to consumptive patients, a snare to their prospects for restoration of health.

I doubt not that many patients, under such disadvantages, would have had as favorable results at the end of the time spent in a climatic cure had they stayed at home under otherwise good care and more favorable conditions.

Patients far advanced in disease, with present active and extending processes, do not, as a rule, thrive in Asheville, and I doubt that they do well anywhere. They should remain at home

[1] Thus the location and building of my institution have been with especial reference to these conditions, which I learn to appreciate more and more.

until the active processes have again come to a standstill. The attending physician can then judge of the utility of further efforts.

If, then, such advanced cases are sent to Asheville in the summer, they can remain until the advent of colder weather, which lasts about six weeks during January and February, when, if needed, places further South are easily reached; but even during the colder weather the temperature, at the hours from eleven to four, is, as a rule, such that a patient of this class can be out of doors when properly protected; to which end he should be provided with woollen lap-robes; and every patient who comes to Asheville in the winter should have one, and should sit or recline out of doors, when not taking exercise.

It is simply absurd to expect a patient to be out of doors for fifteen out of the twenty-four hours, constantly on his feet, on horseback, or in a carriage. There can be no climate that can atone for the injurious fatigue so produced; nor can he sit upon a straight chair in a constrained position with benefit and comfort; and the absence of proper facilities to out-of-door life, without exercise, induces either over-exertion, or the greater part of the time is spent within doors.

As to the results obtained here, the relation of some particular or picked cases would avail little. We, of course, could also show, as people interested in this or the other health resort are fond of doing, in how bad a condition such and such a person arrived here (on a bed, I believe, is the usual story), and how perfect a recovery such patient has made.

Such patients are pointed out on the streets here every day, and the story of their recovery loses nothing of the marvellous by frequent telling.

These subjects of pride to health resorts are themselves fond of exaggeration.

Absolute recoveries at health resorts are not so frequent as they could be, because by far the most of the patients abandon the climatic treatment too early, mistaking improvement for recovery, and realize the mistake only when relapses overtake them. Others think that climate is only a question of temperature, and return home for the time when the latter is endurable there.

Of six hundred and five cases now on my records, and of whom I have subsequent advice, I have sixty-seven permanently recovered cases, seventy more in whom the arrestment of the disease, with comfortable general health, has lasted at least six months. Further, of two hundred and fifty-eight, who left my care very materially improved, in only sixty-two the improvement was none at all, or they grew worse, and those include such cases as I sent home within a few days or weeks after arrival as absolutely hopeless, and also those who arrived in such condition that the return journey was impossible.

No doubt still better results would have been obtained had the patients, who returned home improved, remained longer. Their stay in Asheville was from one to fifteen months, with an average of four and one-half months, a time altogether too short for the accomplishment of lasting benefit in so serious a disease as pulmonary tuberculosis, especially when the patient upon his arrival is at all advanced in or has active processes of his disease.

For this and many other reasons I would particularly call the attention of the profession to the employment of climate as a preventive measure. If it can aid in restoring and curing patients already suffering from the disease, as we know it can, it is also reasonable to believe that it will prevent its occurrence, and the facts that the natives here never, or scarcely ever, become the subjects of consumption, and that the inherited tendency to its acquirement becomes eradicated in the children of such consumptives who remained here more permanently, show conclusively the wisdom of the employment of climate as a prophylactic.

How grand it would be if, instead of the cases arriving here in a hopeless condition, we had in their places those who, by inherited tendencies, we have strong reason to suspect of sooner or later falling subjects to the infection at home, if our chief professional labors were in advising such predisposed patients how to take advantage and how to deport themselves while undergoing a climatic cure, instead of the often discouraging task of patching a shattered constitution and improving the condition of advanced cases, more or less temporarily, only to relapse in the future.

# SHARON SPRINGS, N. Y.,

## And Certain General Reflections.

BY G. A. WILLIAMS, M.D.,
SHARON SPRINGS, N. Y.

SHARON SPRINGS, N. Y., 1200 feet above the level of the sea, is situated on the Albany and Susquehanna Railroad, and is also accessible from the New York Central and Hudson River Railroad at Palatine Bridge, by a pleasant carriage drive of nine miles. It possesses various mineral springs, among which the most important is the White Sulphur Spring. The water of this spring, of which the discharge is four barrels per minute, is clear and bright, with an invariable temperature of 48°. It is highly charged with sulphuretted hydrogen gas, and consequently admirably adapted to all the uses for which sulphur-water is employed.

Residence here, and a careful study of the waters during twelve years of active practice, have convinced me that "the treatment of diseases and morbid tendencies by waters and climate is a branch of general medicine, that it rests upon the same principles, and ought to go hand in hand with sound practice." Much of the dissatisfaction and disappointment of both physicians and patients in the use of mineral waters arises from the neglect, by invalids, of intelligent local care during treatment. The more exhaustive the knowledge of the family physician of the employment of mineral waters, the more emphatic will be his corroboration of this statement, for no man, however distinguished or learned, can accurately determine, at a distance, the immediate daily effect of the "cure," and the patient personally is naturally disqualified from adapting the treatment to the varying symptoms of his disease. In my own experience, my greatest difficulty here has been to overcome the indifference of the patients, and to awaken in them an intelligent attention to their own cases. I have repeatedly said: "If you will attend to your own treatment with as much care as I shall give to it, or will feel as much interest in my directions as I manifest in them, I can almost absolutely guarantee relief." But, again and again, I am obliged to follow them up, and to make repeated inquiries as to whether or not my instructions are being complied with. My apology for dwelling upon this at length is that this has been the common experience of all physicians at springs both here and abroad, and the fact cannot be too strongly reiterated to both profession and laity.

Many persons are sent to mineral springs under general directions from their family physician to go to this or that spring, without specific instructions concerning the treatment. Not infrequently they arrive with symptoms aggravated by the journey and the excitement, anxious to begin they know not what, but in no condition to begin at all, until perhaps certain acute complications have subsided. Under advice to this effect, they become impatient and doubtful of the skill of the local physician, a stranger to them, whose instructions to *wait* seem in direct opposition to those of their physician who sent them to *begin*. The previous treatment elsewhere, the views of the family physician, are a closed book to the local practitioner, who endeavors to extract from the patient himself such history of his case as the patient may be able to impart. During the present season an instance occurred, in the practice of a friend of mine in this place, illustrative of the prevailing conditions herein indicated. He found his patient, on his arrival, with certain heart symptoms which rendered the immediate use of the waters of at least dubious advisability. In reply to the invalid's querulous demand for the reason why the treatment should not at once begin, the delicate question arose as to whether or not the true reason should be made known to the patient. If the family physician had not imparted the knowledge, he probably had good cause for not doing so, and his views concerning his own patient were certainly entitled to respect and consideration from a fellow-practitioner to whom the care of the patient was temporarily confined.

The duties of the bath physician are of a peculiar nature, according to my views of his position, towards the patient, and the patient's own doctor. To use plain language, the patient belongs to the *family* physician; he is temporarily confided to the care of the *bath* physician, whose simple duty is to carry out a supervision of the local treatment at the baths in conformity with the *general* views of the family physician, unless some conscientious difference of opinion as to diagnosis supervenes. In each case, prompt and full communication should be made to the family physician. At least such is my idea of the relative conditions; and in my practice here, it is my custom and my desire to pay this deference to the home physician, and loyally to return his patient to him with such amelioration as my experience with these waters permits me to effect in the cases submitted to my care. I dwell upon this subject because it needs ventilation, for, while little is openly said, I am well aware of the under-current of feeling existing with regard to the course too frequently pursued by bath physicians, which is quite different from the one herein indicated as proper and just in my opinion.

The home physician should send his patient to the springs with a brief written history of his case, accompanied by such suggestions as he may deem advisable. The bath physician should receive the patient as a *trust*, and, if a radical difference of opinion as to conditions arise, his doubts or convictions should be imparted to the home physician and not to the patient.

I trust that I may be pardoned for this lengthy exposition of my views upon this subject. It seems to me that a full and complete understanding of the *relative* positions and duties of the home physician, the bath physician, and the patient, is absolutely essential to accomplish successfully the purpose in which they have a common interest. And these views are alike applicable in the mountains, or by the sea, or at the springs, in fact wherever the described conditions prevail.

In 1884, at Sharon Springs, N. Y., were first introduced into the United States certain methods of using natural sulphur waters (employed in Europe for thirty years or more), by which sulphur water is rendered serviceable in nasal catarrh, and in various diseases of the respiratory organs. The applications, although old elsewhere, were new to me, and I approached them cautiously, observed effects critically and carefully. To-day I can freely certify from my own experience as to their value.

The method, in brief, is the atomization of sulphur waters, by steam, or compressed air, into spray or mist of varying fineness, from a coarse spray to a smoke-like mist, adapted to the indications of the disease in each case; and also the inhalations of sulphuretted hydrogen, mechanically liberated from a constantly renewed supply of fresh sulphur water. Dr. H. C. Wood, in his recently published "Therapeutics; its Progress and Practice," says that his "own experience has led to the positive belief that sulphuretted hydrogen may be very useful in the treatment of various catarrhs." My experience here has been absolutely confirmatory of his belief.

We have here a building planned and built for these special applications, and exclusively devoted to them, the pioneer of its kind in the United States. Within it are commodious and comfortable rooms equipped with the most scientific instruments for the purposes described, under the care of experienced attendants. It is but a short distance from my office; and it is my habit to attend my patients there as much as possible, to encourage them, and to watch closely the effect of the applications in the varying phases. Thus my knowledge is practical, not theoretical. The clinical details from my book of records are too long for an article of this description; the results have been most gratifying. It is impossible to outline any general rule for treatment; the duration, the force, the volume, the moisture, the temperature, can only be regulated on the spot by close watchfulness of progress and careful observation of the idiosyncrasies of each individual case.

In my case-book, I find records of the following diseases in which I have ordered and supervised this course of treatment: Coryza, chronic nasal catarrh, post-nasal catarrh, bronchorrhœa, acute laryngitis, chronic catarrhal laryngitis, laryngeal phthisis, laryngo-tracheitis, acute bronchitis, rheumatic bronchitis. It is only exceptionally that I fail to obtain results gratifying alike to physician and patient.

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*Correction.*—In our last issue it is stated, upon page 8, that "a relative humidity of 69.5 indicates that the climate is fairly dry," etc. This was an error, as the figures should have been 65.5 instead of 69.5.

# THE INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

**Held in London, August 10-17, 1891.**

**Specially reported by Francis J. Allan, M.D., Department of Public Health, University of Cambridge.**

Fifteen years ago the first Hygienic Congress was called together at Brussels by the king of the Belgians. Since then Paris, Turin, Geneva, The Hague, and Vienna have respectively been selected for similar gatherings. In the language of the official programme, "The aim of the Congress is to stimulate public interest in the progress of Hygiene and Demography, by which latter term is understood the study of the life conditions of communities from statistical points of view; and to afford persons interested in these subjects an opportunity of meeting and of elucidating questions connected therewith by conference and debate."

Arrangements for this important event have been taking form for the last fifteen months, and, unfortunately, have not been concluded without some friction and more than the usual amount of heart-burnings. The invitation to hold the Congress in London was given chiefly by the medical officers of health coupled with the Sanitary Institute; but, probably on account of the want of proper organization among the medical men of this country, they allowed an organizing committee to be formed, upon which the names of our leading sanitarians, with the exception of Prof. Canfield, were conspicuous by their absence. This committee took upon themselves the election of officers of the various sections, and while they have made excellent selections in some cases, in others men without any special knowledge of hygiene have been appointed. It is, therefore, with some degree of curiosity that the conduct of the Congress will be watched.

A large number of influential bodies and individuals have freely arranged for the entertainment of the members of the Congress, but no selection appears to have been made, so that all the members might have at least one invitation. The result is that those who first sent in their names have tickets for everything, while the later arrivals are left out in the cold.

We shall mention some of the social events in order.

The Congress was opened on Monday, the 10th of August, by a large meeting in St. James's Hall, the Prince of Wales, who is President, being in the chair.

He was surrounded on the platform by a representative group of delegates and officials, and at once proceeded to deliver an address in which he welcomed all the members of the Congress, and especially those whom it had induced to come from distant countries. He then went on to express his sense of the valuable work which has been accomplished by sanitarians, and quoted from his experiences when, as a member of the Commission on the

Dwellings of the Working Classes, he had visited the worst districts of the large towns of this country. It had appeared then as if the task of averting the dangers to health were an almost hopeless one, but he rejoiced to observe how much had already been achieved in this direction, and he thought the time was fast approaching (and this Congress would, he hoped, hasten it), when throughout the world national health would be regarded as national welfare. The different nations of the world were now in such close contact that no one could afford to disregard the sanitary condition of its neighbors. They were all so intimately connected that the unhealthy condition of one country must have a more or less direct influence upon the others.

Dr. Bronadel, Dean of the Faculty of Medicine of Paris, and President of the Permanent Committee, then addressed the meeting in French, reviewing the measures passed in Britain for the protection of the public health. Addresses were also delivered by Prof. von Kohler, Director-General of the Prussian Army Medical Department; Prof. Corradi (Parra); M. Jos. Korosi (Budapest); and Dr. Notts (Saxony). Votes of thanks were then proposed by Sir James Paget and Dr. Geo. Buchanan, and the proceedings came to a close.

On Tuesday, the 11th, the work of the Congress began in earnest. All the members had arrived, and the reception-room, where tickets for the various events for the week could be obtained, was crowded. Apparently, the officers had not expected the large numbers which continued to arrive from all parts, and the staff and accommodations were severely tried. A room for members to write in was a great desideratum; and its absence was the cause of some discontent, especially from foreign visitors, and it ought certainly to have been provided. Efforts on a small scale were made later to meet this; but they were decidedly insufficient. This is a point which may profitably be kept in mind for future Congresses.

To take each Section in order and follow it throughout the Congress will bring us first to that of

### Section I.—Preventive Medicine.

In this Section Sir Joseph Fayrer presided and delivered an opening address, in which he alluded to the unprecedented progress in human knowledge which had marked this century.

Preventable diseases still killed every year in this country about 125,000 persons, being responsible for nearly one-quarter of the total mortality; and he calculated that 78½ millions of days of labor were lost annually to the country from this cause, representing a loss of 38¾ millions of dollars, and this did not include the days lost by the exhaustion so often induced by the unhealthy homes of the poor. He then referred to the abuse of stimulants and narcotics, and to the possible deleterious influence of mistaken notions of education as worthy of the closest attention.

Among the papers read were a number dealing with the mode of preventing the spread of epidemic disease from one country to another. It was introduced by Surgeon-General J. M. Cunningham, lately of India, by Prof. Proust, of Paris, Inspector-General Lawson, R. N., and Dr. Ashburton Thompson, of New South Wales, and resolved itself practically into an animated discussion on the value of "quarantine," the theory of which was generally condemned. Dr. Thorne, with a large number of distinguished savants, took part in the discussion, and said he recognized that so long as a country did not set itself to remove all insanitary conditions within its borders it must rely upon some kind of quarantine, but that it was difficult, if not impossible, to enforce it with any approach to the strictness required; if cholera and other diseases were conveyable by atmospheric currents, as many believe was sometimes the case, then quarantine must necessarily fail.

Dr. Hewitt, of Minnesota, said that all cases of infectious disease penetrated into his State from New York and chiefly from Liverpool. He thought a properly organized inspection might do much to prevent their importation. Authorities on both sides should establish communications with one another. He narrated the story of an epidemic of small-pox distinctly traceable to the clothes of a woman not herself a victim, but who had been in contact with sufferers on the other side.

*Diphtheria.*—A discussion on this interesting subject was opened by Dr. Seaton. He narrated the instance of a village which had always been free from diphtheria and from any disorder that could be confounded with it, when, on a new system of sewerage being introduced, a severe outbreak of diphtheria occurred (*post hoc* or *propter hoc?*). He thought perhaps the disturbance of the soil may have led to the freeing of germs, but the question was one which opened up a large field for inquiry.

Dr. Schrevens, of Tournai, then gave his experience in Belgium. For ten years it had been noticed that the curves of typhoid fever and diphtheria rose and fell together. He evidently agreed with the recent lectures of Dr. Thorne on this subject in asserting that primarily both diseases depended largely upon organic contamination of the ground; impurities on the surface of the soil suit the bacilli of Löffler in a special degree, while the impurities of the subsoil are more favorable to the bacilli of Eberth. These complaints have been more prevalent in country districts where the soil surfaces are not so carefully looked after as in a well-drained town. The question of dampness was also taken into consideration, Löffler's bacillus being destroyed by too much moisture.

Dr. S. W. Abbott then followed with an interesting paper, which was much applauded. He gave a general description of the State of Massachusetts; its topographical and climatic features; the growth, character, and density of its population (native and foreign); and its vital statistics from 1871–1888, compared with the tables of Longstaff and others, with especial reference to diphtheria.

Dr. Hewitt, of Minnesota, also spoke, describing his State and its connections with diphtheria. He arrived at two conclusions:—

(1) From 20 to 30 years of age women are more liable to diphtheria than men (women generally the nurses).

(2) 44 per cent. of all cases, regardless of sex, occur at 5 years and below.

Dr. Bergaron, Dr. Felix, of Bucharest, and Dr. Gilbert, of Havre, Drs. Paget and Adams, of England, followed with contributions; but no fresh additions over the conclusions of Dr. Thorne seem to have been made to the discussion. The disease has evidently its habitat in impure soil, but in towns, in schools and places where persons congregate the infection takes place from one person to another.

*Use and Abuse of Alcohol.*—Sir Dyce Duckworth, M. D., Mr. John G. Phillips, of the Sceptre Life Assurance Association, and Prof. Westergaard, of Copenhagen, read interesting papers dealing with various phases of this important subject. The first speaker, while considering the use of alcohol often beneficial, said it brought in its train more general and widely spread evil because its use was to a degree so bound up in our ordinary life. He believed that the abuse of alcohol was less prevalent than formerly. He thought most people required a little, and that those who felt no need for it had an idiosyncrasy. Children required none, and the sale of alcohol to them should be made penal. He thought total abstinence to be too violent a measure to take for the benefit of weaker vessels. He favored, however, a degree of local option. Chronic drunkards might be classified as the foolish, callous and vicious drunkard, and the victim of inherited or acquired nervous disease. The former should be stringently treated; he should lose his rights of franchise, and, if his conscience or self-esteem could not be made to smart, then his body should.

Prof. Westergaard spoke of the difficulties of obtaining exact statistics regarding the effects of alcoholic consumption, and recounted the various indirect methods on which we had to rely.

He alluded to proposals to make inebriates minors, and for punishing crimes committed in a state of drunkenness as severely as in a sober state. He thought an increase of the exercise and duties levied, as in Switzerland, had a good sanitary effect. Access to spirituous liquors should be rendered difficult. The prohibition system (Maine laws) were faulty, as the importation and sale were allowed in the "original packages;" similar objections might be urged against the "local option" system, although fraud can be more easily detected.

The "high license" system seemed more effective by reducing the number of saloons, and causing those who pay the high license to help the authorities in the conviction of breakers of the law. Under the "Gothenburg" system, adopted in Sweden, Norway, and Finland, licenses are given to companies, which are only allowed to give the shareholders a fixed rate of interest, leaving the surplus for the benefit of charitable institutions.

There should be a limitation of the hours during which saloons may be open, especially on Sundays. In Norway the sale of spirits is forbidden from Saturday afternoon till Monday morning.

Mr. J. G. Phillips then gave a brief account of the experience of the Sceptre Life Assurance Association, in which he stated that a much lower death-rate existed among total abstainers than among their other policy-holders.

Dr. Norman Kerr, President of the Society for the Study of Inebriety, made a strong speech. He thought the appalling evils wrought by alcohol could be remedied in time

(1) By recognizing inebriety (or, as he called it, "narcomania", a mania for intoxication or torpor) as a disease, and drunkenness as very often but an effect or symptom. A fair proportion, as the experience of various hospitals showed, could be cured.

(2) By legislation providing for the compulsory reception and retention in retreats of inebriates too demoralized to apply of their own accord, for the

reception of voluntary applicants on a simple agreement without the intervention of a justice, and for the care of the poor and those of limited means.

Sir Joseph Fayrer pointed out that the young man whose business lay in the tropics who neither smoked nor drank was, in his opinion, doubly armed against the climate and its ills. From forty years' experience, chiefly in the tropical climates, he could speak of the value of abstinence; but to the middle-aged man whose habits were formed, he said that nothing need disturb those habits so long as they were attended by no ill-result, but he would warn such that the need for alcoholic support was one which grew insidiously and rapidly.

Dr. Hewitt thought the Maine law a failure, but spoke favorably of the efforts of American ladies in the temperance cause. The way of the drunkard should be made difficult for him.

Prof. Allighare was of the opinion that it was the quality, and not the quantity, of liquor that did the harm.

*The prevention of the spread of Influenza.*

Dr. Richard Lisley read a paper on this subject. He agreed with the now accepted opinion that influenza spreads chiefly along the lines of human intercourse, but may also be wind-borne. He recommended the following measures:—

(1) General hygienic measures.

(2) The use of prophylactics. He thought quinine was not reliable. The application of a solution of boric acid to the conjunctivæ of those exposed to infection was held to be successful.

(3) The avoidance of infection—as at parties; public entertainments; avoidance of contact with those suffering; disinfection of letters; parcels; and closing of schools.

In this connection your reporter may mention the use of ærial disinfectants, as eucalyptus. Sanitas oil evaporated in the room of a patient has been successful, not only in the preventing others becoming infected, but in even checking the disease in its early stage.

The final meeting of the section was occupied by papers on the improved hygienic condition of maternity hospitals by Dr. W. O. Priestley, showing the reduction of deaths from the adoption of antiseptic or aseptic modes of treatment; and on the hospital and ambulance arrangements in London for infectious diseases by Sir V. K. Barrington.

A large number of members of the Congress took advantage of the opportunity to visit and examine the fever hospitals and the smallpox ship-hospitals in the Thames.

*(To be continued.)*

# REVIEWS.

INTERNATIONAL CLINICS: *A Quarterly Collection of Clinical Lectures on Medicine, Surgery, Gynæcology, Pediatrics, Neurology, Dermatology, Laryngology, Ophthalmology, and Otology.* By Professors and Lecturers in the leading Medical Colleges of the United States, Great Britain, and Canada. Edited by JOHN M. KEATING, M. D., and J. P. CROZER GRIFFITH, M. D., Philadelphia, and J. MITCHELL BRUCE, M. D., F. R. C. P., DAVID W. FINLAY, M. D., F. R. C. P., London. (Illustrated.)

IN a day when the study table of the physician groans under its load of medical periodicals—of those which have been paid for and those which enterprising publishers or still more enterprising druggists heap upon the man of medicine—it is a pleasure to turn from much of this, which is but a superfluity and a weariness to the brain, when read, to the new quarterly periodical published last month by the J. B. Lippincott Co., entitled "International Clinics." The editors should receive the grateful support of the intelligent practitioner for conceiving the happy idea of gathering together the pick of the clinical lectures delivered on both continents.

It is no small matter to be saved hunting through the various magazines for clinical reports, and to know where to turn in one's library to the latest utterances of the best teachers, and so at once, as it were, to plunge into the current of the life of the schools, and with so little labor keep one's self abreast of the times. Two volumes have already been issued, and if such or similar material can be presented in the future ones there can be no question of the success of the enterprise. Thirty-seven lectures are to be found in the first volume, coming from the lips of eminent teachers in Manchester, New York, Glasgow, London, Montreal, Boston, Philadelphia, Chicago, Atlanta, New Haven, Ann Arbor, Leeds, Buffalo, Cincinnati, St. Louis, and Baltimore. Several of the lectures are carefully and handsomely illustrated. The second volume opens with a memoir of Joseph Leidy. The first feeling is surprise at finding this in a journal devoted to clinical medicine; but a little reflection allows one to see the fitness of enshrining the memory of this great biologist among the records of the thoughts and actions which have sprung into their best fruition from the only true soil, for the growth of scientific medicine, that of anatomy and biology. We therefore gladly welcome this graceful tribute to one of America's greatest savants and most honorable and pure-minded of men. Thirty-one clinical lectures follow, of merit and interest equal to those in the preceding volume. It is impossible to review any of them in the limited space at hand; but to all who desire to march with the times in the foremost ranks of practically applied scientific medicine we commend these volumes.

S. E. S.

A Clinical Text-Book of Medical Diagnosis. By Oswald Vierordt, M. D. Translated by Francis H. Stuart, M. D. Published by W. B. Saunders, 1891.

The present volume is, as stated on the title-page, the authorized translation of the second improved and enlarged German edition, with additions. Coming from such an authority, one expects to receive a complete and accurate description of the methods employed in studying disease. Such in fact is this work found to be.

A general description of the contents and arrangement of the volume will give an idea of the ground covered, and will to a slight extent show the completeness with which the author has treated the subject. The first few pages are occupied by a description of the investigation of cases by methods other than those of direct examination, and includes the subject of note-taking in general, the taking of the previous history of the patient, and that of the present disease. The next chapter is devoted to a brief consideration of the subject of the direct examination of the patient, and to it are appended by the translator a plea for note-taking and a well-arranged and complete schedule for the orderly recording of the results found.

Part II. is devoted to a detailed study of various divisions in the general examination of patients, including that of the psychical condition, the position in bed, the general structure of the body and the state of nutrition, the condition of the skin and subcutaneous tissues, and the temperature. The section devoted to thermometry is particularly complete and is accompanied by numerous illustrative charts.

In Part III. the author takes up the subject of special diagnosis, each system being investigated in order. Starting with the examination of the respiratory apparatus the author devotes a few paragraphs to the changes found in the nose, in so far as they relate to medical as opposed to surgical conditions. The symptoms and signs referable to the larynx are then considered briefly, leaving the more detailed description of laryngoscopy for a portion of the appendix. Following this is the section devoted to physical diagnosis as applied to the lungs. The author has here shown great discretion in avoiding the too elaborate discussion of abstruse and undecided questions in reference to the signs elicited in various conditions, but lays before the reader a clear and succinct account of the physical signs present, with his own views as to their causation. A very complete description is then given of the macroscopic and microscopic appearances of the sputum in various diseases, including the methods for staining the micro-organisms of tuberculosis and pneumonia.

In the next chapter the examination of the circulatory apparatus is considered, the normal and abnormal conditions of the heart itself being first discussed. The description of the various organic heart murmurs is well given; but one is rather surprised at finding, in the section devoted to the transmission of murmurs, that no mention is made of the transmission to the left and to the angle of the scapula of the murmur of mitral incompetence, the author merely stating that it "is sometimes conducted toward the right as well as further upward." The pulse receives a deservedly full description, and numerous sphygmographic tracings are interspersed typefying the pulse in various organic heart lesions. The normal and abnormal conditions of the arteries and veins are then considered, including the subject of aneurism. The author then describes the alterations of the blood as to coloring-matter, corpuscular richness, changes in the individual corpuscles, and presence of parasites, micro-organismal and others. As with most German clinicians, the author lays but little stress upon the etiological and diagnostic value of the malarial parasite.

The study of the digestive apparatus is then pursued, including the conditions found in the mouth, œsophagus, stomach, and intestines. A full, clear description is given of the most approved methods for use in the examination of the gastric digestive power, rate of absorption, etc. The diagnosis of diseases of the liver and spleen receives careful and complete consideration. The chapter closes with an account of the physical appearances of, and the significance of changes in the fæces and vomited matter.

In the chapter devoted to the examination of the urinary apparatus, the author first gives a sufficient amount of attention to the local examination of the kidneys, ureters, and bladder, after which the subject of urinalysis is clearly expounded and completely discussed. For the detection of albumin the author recommends as about equally accurate the acetic acid and ferrocyanide of potassium, the heat and nitric acid, and the picric acid tests. As tests for glucose, he specially mentions the bismuth, phenyl-hydrazin and Trommer's reactions.

The nervous system is the last to be considered. After a brief account of the physiological anatomy of the central nervous system, the author discusses the signs of disease manifested on the skull, spinal column, and peripheral nerves; mental alterations, disturbances of motility and sensibility, trophic alterations, the superficial and deep reflexes are well considered; after which a deservedly long section is devoted to the diagnostic uses of electricity. Ataxia and motor derangements (including chorea, athetosis, epilepsy, catalepsy, and hysteria) have each received their share of notice. A useful and complete enumeration of the voluntary muscles, grouped according to the effects produced by their contraction, is here introduced. The arrangement of the muscles thus into groups is one of much practical advantage, and is a decided addition to the other merits of this section. The various speech alterations, now attracting so much attention, are carefully investigated and explained, the author presenting a fairly clear view of what is still so obscure a complex of functions. The special senses of hearing and sight are then considered in their relation to diagnosis, the chapter being concluded by a short account of the relation between nervous diseases and disturbances of the vegetative system.

To the main body of the book is attached an appendix, in which are more minutely considered the subjects of laryngoscopy, ophthalmoscopy, and the study of the various pathogenic micro-organisms.

The book before us can safely be said to be as complete and comprehensive a text-book of medical diagnosis as any that we now possess. The systematic and complete consideration of each system leaves nothing to be desired either as a text-book to the student, a guide to the young practitioner, or a work of reference for those longer engaged in the practice of their profession. The translator deserves much credit for the additions inserted by him, and for the manner of his translating, although his desire to adhere as closely as possible to the original German text has, in places, rather marred the harmony of his phrases. This, however, is but a minor fault, and can readily be overlooked in consideration of the general excellence of his work.

The volume is well-printed, of attractive appearance, and is well illustrated by numerous practical figures, many of which are novel.

## BIBLIOGRAPHY.

*The* EDITORS *request that Pamphlets and Reprints of Papers be sent them for notice or review under this heading.*

EPIDEMIC INTESTINAL DISEASES IN ALBANY AND VICINITY. By JOSEPH D. CRAIG, A. M., M. D., Albany, N. Y. (Reprinted from the Albany Medical Annals, May, 1891.)

We regret that space will not permit us to do more than present the author's conclusions in his own words, as we firmly believe that the only way by which the authorities of the cities, towns, and villages in the length and breadth of this country can be forced to appreciate the necessity of a pure water supply (pure ice also), and safe drainage-systems, is to give as much publicity as possible to papers of this kind, to teach the public what they ought to have to keep healthy and live long.

The author bases his paper upon the replies sent in response to a circular letter, a popular method of obtaining facts from reliable sources.

"It has been abundantly substantiated that wherever there is a broken drain or improperly trapped or ventilated, or in any way defective system of plumbing, there will be found a vitiated and poisonous atmosphere. Any human being inhaling such contaminated air will suffer in greater or less degree from its debilitating influence, and a proportion of these will be in such a non-resistant condition as to readily acquire any of the specific diseases, from whatever source derived, when brought within the range of their influence. I believe, in view of the strong evidence which follows, pointing to the drinking water as the great causative factor, that this is the best explanation of the fact that in so many houses in which typhoid fever has been found, the inspectors of our board of health have discovered incompetent drainage systems.

"The facts obtained in relation to water supply are of vastly more importance. There were fifty-nine returns in all, which can be fairly classified as follows:—

"1. Wherever spring or lake water was used exclusively (ten places in all), irrespective of sewerage system or drainage and irrespective of atmospheric conditions of the most diverse kinds, in every one of such places there was neither diarrhœal disease nor typhoid fever.

"2. Wherever the water supply was derived from wells, there was found either diarrhœa or typhoid fever, or both.

"3. Wherever river water was used from head waters, or only slightly contaminated as shown by chemical tests, there was neither diarrhœa nor typhoid fever.

"4. Wherever there were centres of population placed near together, using river water contaminated largely with sewage from places above, there were both diarrhœa and typhoid fever.

"That the statement that rivers, filled to overflowing after heavy rains and great thaws, contain the germs of disease diluted in a great degree, is found to be fallacious. These rivers do not contain large volumes of water with a proportionately less number of germs, but as shown in 1st, above, are filled with large volumes of water, polluted with a proportionately larger number of germs, washed from the soil.

"That rivers contaminated with sewage and covered with ice were more dangerous as sources of water supply, through insufficient aëration of the contained water, than when open. Among men engaged as boatmen during the summer and ice-cutters during the winter, and drinking river water at all seasons, it was distinctly observed that such men were free from diarrhœal disease in the summer, but were largely affected in the winter.

"From the foregoing statements of facts, together with other facts, for the presentation of which there has not been time in this paper, all largely contributed through the kindness of the profession, I am led to the following conclusions: Excluding from consideration the abdominal type of la grippe and the diarrhœas caused by bad food and sudden changes in temperature, I believe the epidemic diseases prevalent during the past winter to have been due—

"1st. To the following contributing causes:—

"(*a*) An ice-bound condition of the Mohawk and Hudson rivers, whereby contaminated water was not sufficiently aërated, and the destruction of such contamination by oxidation was prevented.

"(*b*) Additional contamination occurring after thaws and rains, the earth being frozen and preventing absorption, and the surface accumulations of decomposing animal and vegetable materials being washed directly into rivers and wells.

"(*c*) Non-acclimated persons drinking for the first time water to which they had not been accustomed.

"(*d*) Polluted milk supply.—I am informed that a number of cases of typhoid fever in Albany occurred among people using milk obtained from the same milkman.

"(*e*) Sewer gas acting as a debilitating agent, and, in occasional instances, as a direct cause.

2d. And to the following as a chief cause:—

"(*a*) Typhoid fever and diarrhœas endemic in Schenectady, caused by the use of either the polluted city water or private wells, or both.

"(*b*) The water of the Mohawk contaminated by the city sewers of Schenectady, polluting the water supply of the city of Cohoes at the intake at Crescent above the Cohoes Falls.

"(c) The waters of the Mohawk again contaminated by the city sewers of Cohoes below the falls and polluting the drinking water of both West Troy and Albany.

"If I had any bias at all at the beginning of this investigation, it was in favor of the river water as a proper and healthful source of public supply. It is to me at least a most convincing argument that the above conclusions were forced upon me by the powerful logic of the facts obtained."

# CORRESPONDENCE.

BAD BERTRICH, GERMANY,
*July* 28, 1891.

MY DEAR DR. KEATING:

I left home on the 20th of June, and it is not until now that I have a copy of the Prospectus of the CLIMATOLOGIST and your accompanying letter. I wish you all success in the good work of creating and diffusing, by means of so valuable a journal, information bearing upon the relations of climate, water, diet, occupation, etc., upon the public and individual well-being. Later on, I trust, I shall find opportunity to communicate some studies upon water-supply, and the present outcome of the immense amount of expert study in Europe and America bearing upon potable water. But at present, being away from my library, and taking the "cure" at one of the mineral springs in Germany, this is not convenient, and meanwhile some words about the peculiar features of these German baths may be of interest.

The first point which strikes an American is the careful regulation, even to minutiæ, of all matters which contribute to the value of the baths as a sanitary resort. Too frequently experience at home shows that summer resorts grow up without any proper forethought or regulation, and every autumn witnesses an outcrop of typhoid and other disorders, contracted at the very places to which people have resorted on account of their supposed healthfulness. A spot on which nature has conferred rare advantages, in the way of pure air and perfect water and most attractive scenery, is presently disfigured by a conglomeration of pretentious modern hotels, straggling shops and huts, and rendered odious by foul air, water, drainage, etc. The vapors of essential oils and the high percentage of ozone and hydrogen-peroxide in the atmosphere of the Adirondacks render it peculiarly valuable in the treatment of throat and lung disorders; but everywhere I have found hotels and boarding-houses most offensive by ill-arranged and ill-kept water-closets. The epidemics that have frequently broken out at the resorts along the New Jersey coast have caused its State Board of Health to do all in its own power, and by developing the sphere of activity of the local boards of health, to improve and regulate the sanitary condition of these places. But the task is a difficult one, when we consider the jealousy of any interference with individual action, even when that action is based upon wilful or ignorant violation of health laws.

The study of such a German health resort as that of Bad Bertrich offers some interesting points of comparison. It owes its present reputation as the "mild Carlsbad of the river Mosel" to the facts elicited by a most exhaustive analysis of its mineral springs, and to a comparison between these facts and clinical experience with those noted in relation to other more widely known baths. Fresenius has given, not only the percentages of the potassa, soda, lithia, etc., but the amounts of bromine, iodine, fluorine, arsenic, boracic acid, and so on, even though these amounts are nearly infinitesimal, recognizing the therapeutic value of these constituents even when existent in minutest quantity. The examinations were made under direction of the German government. From these it appeared that the water belonged to the category of the warm alkaline-saline mineral springs, and presented a very close analogy in all points to the Carlsbad, but contained only about one-third as much of each and every constituent as the Carlsbad water.

But it is not so much of the water itself as it is of the general conduct of the health resort that it is my present purpose to write. To begin with the baths, they are a model of cleanliness and order. A government inspector issues tickets of use for them and for the towels; requires payment of a considerable fee for the care of the grounds, the music, the general reading-room, casino, etc. The attendant's first question is whether the person taking the baths has consulted the resident physicians, who hold their places by State appointment. The physician, after careful diagnosis, frequently modifies, by the use of other medicaments, or by the so-called "Moor-bad," etc., the action of the water, when drunk or bathed in. At half past six in the morning excellent music is given by the band, lasting till breakfast at eight, and the water-takers have the pleasure of promenading in the intervals in a garden and under porticoes, rendered most attractive by shrubbery and flowers After breakfast one has the choice of walks leading for miles through woods of a character I have never seen in our own country. Instead of being at the mercy, as they are in the Adirondacks, of every railroad or timber company, or the lawlessness of camping parties kindling fires and destroying where they choose, these exquisite woods are under the charge of State foresters. These men wear a picturesque uniform of green, with their insignia displayed, and are men of character, and specially trained and educated to this business. The unauthorized maiming or cutting of a tree is a criminal offence, and everything is done for the beautifying of the forest, for increasing its wealth in fish and game, and for rendering the income of the State from its woodlands more productive.

The hotels and boarding-houses, instead of disfiguring a desolate wilderness of streets, are picturesquely grouped about the springs, the bath-houses, the casino, and the garden. They all participate in the benefits derived from the tax paid by each visitor for the support of the music and amusements shared by all. Each morning the grounds, the roads, the walks, even those extending for miles in the forest, are swept by hand, and nothing which can offend the sight or smell is permitted. All these cares and precautions and outlays of time, money, and labor are matters of a wise economy and productive of pecuniary as well as of sanitary wealth and health. There are a science and art in the laying out and management and development of mineral springs and health resorts, which are advantageous to the well-being of the clientele as they are of the hotel proprietors, and as yet the benefits of combining these two advantages have been rarely appreciated in our own country.

Very truly yours,

ALBERT R. LEEDS.

# ABSTRACT FROM CURRENT LITERATURE.

IN CHARGE OF H. W. CATTELL, M.D.

*The* EDITORS *request that Reports of Papers read before Societies, Reprints of Articles, Letters from Physicians containing matters of General Interest pertaining to the Subjects in the Title-page of this Journal should be sent to the* EDITORIAL OFFICE, 913 WALNUT ST., PHILA., *marked for* CLIMATOLOGIST.

## LIFE INSURANCE.

**Supplementary Instructions** have been given to the medical examiners of the Penn Mutual Life Insurance Company as follows:—

"It is the request of the Medical Board that in each and every case height and weight be ascertained, the examiner actually weighing and measuring applicant. In all cases of over or under weight, and of $5000 and over, unless height and weight be given accurately, no action upon the papers will be taken; in this event, the responsibility of delay must rest with the examiner."

A strict observance of this will greatly aid the Medical Board in its work.

*Vaccination.*—The fact of an applicant not having been successfully vaccinated will hereafter not prove a barrier to his acceptance by this company, although in all cases we prefer that the question should be asked and answered.

*Double Examinations*—Examinations by two examiners will hereafter be required in all cases where the total amount of insurance in this company reaches $15,000, or over, or in any case when the medical director deems it necessary.

*Microscopic Examination.*—In addition to the regular examination of an applicant, a microscopic examination of the urine will be required in all cases when the total amount of insurance reaches $20,000, or over, or in any case when the medical director deems it necessary.

One microscopic examination will suffice in any case, and for this an additional fee of $5 will be allowed.

**Opium Addiction as Related to Life Insurance.**—Dr. J. B. MATTISON discusses the length of time that is necessary to intervene from the stoppage of taking opium in a habitué before the issuing of a policy by an insurance company. The writer has examined the instructions given to the medical officers of thirty leading companies, and on the above point all are silent. On conferring with the medical directors of a dozen leading companies it was found that the rule is to refuse such applicants and demand a three to ten years' probation. While the habitual use of opium may produce structural change in the kidneys, the ex-opium habitué can present a claim for life insurance which should entitle him to an earlier and larger consideration than the dram-drinker. As to the probation period the largest risk of readdiction is before the seventh month; and there is no legal objection to making the policy conditioned upon the leaving off of opium and the examination of the individual at certain times to see if he has really followed out his promise.

The author concludes his paper with the remark that three years of entire abstinence from opium, if no more than five years of addiction, all other conditions being favorable, should entitle an applicant to insurance.—*New York Medical Examiner*, June, 1891.

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**The Report of a Medical Examiner for Life Insurance.**—There are few things that suggest more significant and valuable lessons as to public health, disease, heredity, etc., than the report of a conscientious and skilled medical examiner for a well-managed life insurance company. That such reports may yield the best lessons, the examiner must be one that does not blindly follow the statistics of others' gathering, nor mechanically carry out old-established rules. For example, to extend the system of averages over areas where diverse conditions prevail, hides from view the operations of special causes and conceals the lessons of special prolaxes. Such dangers are carefully guarded against in the perspicuous summaries of his work made by the medical examiner-in-chief of that well-known organization, the Royal Arcanum. Of 5855 applications submitted to him in 1890 by presumably healthy men, 1302 were rejected. This large proportion of rejections arouses a somewhat startling inquiry as to the general state of physical health of the average American citizen. In a membership of 105,397 the deaths were 925, or a death-rate for the order of 8.77 per thousand. As to the relative death-rates of the different states, taking the average of the past five years, we learn that Arkansas was, by a large plurality, the least healthful of all the states, the number of deaths per thousand members of the order having been 20.8. Georgia comes next in order, 13; then Virginia, 11.9; and the District of Columbia, 11.1. The rate of North Carolina was 10.9; Tennessee, 10.6; Maryland, 9.9; Missouri, 8.7; Pennsylvania, 8.6; New York, 8.5; Massachusetts, 8.1; Ohio, 7.8; New Jersey, 7.6; Michigan, 7.5; Indiana, 6.5; Illinois, 6.4; Wisconsin, 6; Rhode Island, 5.4; and Connecticut, 4.9.

The deaths from acute affections of the lungs were this year far in excess of those of previous years, a result undoubtedly due to the pneumonia following influenza. La grippe is charged with at least 87 of the 932 deaths. Dr. Seaverns divides these deaths into three classes: 1, those occurring from the direct influence of the disease (47); 2, those in which previous disease was aggravated by influenza (20); 3, those in which the person succumbed to other disease for which la grippe prepared the way (20). The mortality was again the greatest in the Southern States. As to the deaths from phthisis, Rhode Island has the place of honor, not a death from this cause occurring among over 1000 members. Wisconsin and Indiana come next with a rate (from phthisis) of only 0.4 per thousand deaths; that of Pennsylvania, Massachusetts, and Tennessee being about 1; while Virginia, North Carolina, Michigan, and New Jersey have a rate of about 1.8 or 1.9. Notwithstanding the great caution in excluding doubtful risks, it is a somewhat sad commentary on medical provision to learn that 54 out of the 932 deaths occurred within a year after the entrance examination had been passed. The report is full of interesting facts that we regret we may not recapitulate.—*Editorial*, *Med. News*, July 11, 1891.

## MINERAL SPRINGS AND SANATORIA.

**Guber Mineral Water.**—According to H. Paschkis (Wiener Klin. Wochenschr), the Guber water of Srebrenica in Bosnia contains, in two fluid-ounces, a third of a grain of iron, and about one-hundred and fiftieth of a grain of arsenic. The water is colorless, without odor, and with an acid and astringent taste, making it a not disagreeable water to drink. If a local action on the stomach or intestine be desired, the water should generally be taken upon an empty stomach. If a systemic action is intended, it should be taken with food. Nervous dyspepsia and any kind of dyspepsia in neurasthenic people are the most benefited by a course of treatment with this water. A favorable action is generally obtained in from six to eight weeks. Three cases of simple chlorosis were cured in eight weeks. Two cases of oxyluria with slight traces of sugar were cured, but the author states that the arsenic cannot be claimed as having had any action on the diabetes. Favorable results were obtained in furunculosis. Two cases of slight psoriasis gave no results, this probably being due to the small amount of water administered.

As in other preparations containing arsenic it is well to commence with a small dose, and increase in quantity until treble the amount is taken, this amount to be gradually diminished.—*Lancet*, March 14, 1891.

## PREVENTIVE MEDICINE.

**Experiments upon the Influence of the Mineral Constituents of the Body upon Immunity from Infective Diseases.**—T. Lauder Brunton and T. J. Bokenham have been carrying on some researches in regard to the introduction of potassium, calcium, magnesium, and aluminium into the system of animals in order to see if an increase in the mineral constituents of the body would or would not confer any immunity upon the animals in regard to infective diseases.

The authors state that one of the most striking points in regard to infective disease is the degree in which animals resist their attacks or succumb to them. The explanation usually sought to explain this is the power of living cells or of albuminous substances to destroy or neutralize the poisonous products of the microbes. It has been found by Gilbert and Laws that the ashes of different animals are not alike in their composition, and it seems therefore possible that the difference in the mineral ingredients of the animal's body may be one of the factors in determining the amount of resistance it may present to infective disease.

Brunton and Cash have already found that the poisonous action of barium could be to a considerable extent counteracted by the previous feeding of the animal with potash. Cash succeeded by treating the animal with perchloride of mercury in conferring immunity against anthrax. The experiments made by Foder would show that sodium bicarbonate may confer immunity from anthrax, while Chor has performed the same experiments with opposite results, and shows that the injections as given by Foder may alone cause the death of the animal. In February of this year the authors commenced their researches by feeding a number of guinea pigs with bran containing potassium chloride, 30 to 60 grams per kilo. To this diet was added a little cabbage, and the animals thrived remarkably well on this food. After being fed for from three weeks to three months on this food, containing an excess of potassium chloride, the animals were inoculated with anthrax, the controls being inoculated with the same virus. The results of the experiments go to show that saturation of guinea pigs with potassium chloride in no way confers immunity against anthrax; in fact, that in animals so treated death occurs more rapidly than in the control experiments. This result may be due either to the positive action of the potassium itself, or to its having tended to cause the elimination of other bases, such as sodium and calcium. Experiments upon the action of calcium, magnesium, and aluminium are now in progress, and the writers hope shortly to communicate the results of them.—*British Medical Journal*, July 18, 1891.

**Etiology of Consumption.**—From a careful study of 102 cases of consumption in the borough of Oldham, JAMES NEVIN finds a considerable amount of evidence to show the direct infectiveness of this disease. The great value of preventive measures is at the same time demonstrated, and this lesson is further enforced by the small evidence of heredity which these cases offered. The influence of bad houses in predisposing to the disease is clearly marked, and still more clear are the influences of a weak physique and of intemperate habits. Occupation *per se* is less of a factor than we have been accustomed to assign to it; and the author therefore concludes that we can proceed with confidence to urge precautionary measures, such as we know to be of avail in averting disease.

## RACE.

**The French Birth-Rate and Depopulation.**—In France the birth-rate is diminishing to such an extent that it will not be long before the death-rate will exceed the birth-rate. The French census of 1886 shows an increase of only 0.39 per cent. on the returns of 1881, while in Germany the rate of annual increase is .0.7 per cent., in Belgium 0.9, in Spain and Italy .0.6. Moreover, in France the birth-rate is diminishing, so that it will not be long before the death-rate will exceed the birth-rate. In 1856 the childless families constituted 17.3 per cent. of all families; in 1886, 20 per cent. The unmarried adults in 1856 composed 10.4; in 1886, 14.4 per cent. Patriotic Frenchmen—statesmen and philosophers—know what these figures mean, just as a physician knows the meaning of decreasing nutritional power in his patient.

The forms of treatment proposed are many. All depend upon the special etiology ascribed to the disease by the friends of the patient. Sexual immorality is by some thought to lie at the bottom of the mischief; by others the blame is laid upon the law of inheritance; by still others, to the use of tobacco, etc. Monod, director of the Public Health, says that proper and feasible sanitation would certainly save 130,000 lives annually. Brouardel holds the state responsible for 14,000 lives annually sacrificed because vaccination has not been made compulsory. All, however, are agreed that the State shall be called in as a physician-in-charge. Taxation of bachelors, rewards to fathers of large families, and many like proposals do not seem to reach the root of the matter. With a sublime indifference to the ethical aspect of the question—nay, even with most noteworthy encouragement of sexual immorality—the French Academy has offered its services as consultant, and at its last meeting unanimously, *and with applause*, passed the following resolution:

"That in each department there shall be established at least one asylum for the care of pregnant women during the last months of gestation; that if she wishes it each woman shall be so cared for that absolute secrecy shall be preserved as regards her entrance, stay, and delivery in the establishment and as to her departure from it; that all administrative inquiry as to the place of residence and identity of the patient shall be interdicted; and, finally, that financial aid shall be given to such women as from insufficient means are unable to bring up their children."

In encouraging illegitimacy, the Academy evidently accepts the Jesuit maxim that the end justifies the means, and is also of the opinion that quantity is of far more value than quality. To an outsider it all appears more like stimulation than nutrition, and we hesitate about giving a definite prognosis.—*Editorial*, *Med. News*, July 4, 1891.

**Predisposition to Disease in the Negro.**—From an analysis of the diseases of 430,466 colored patients treated by the medical department of the Bureau of Refugees from 1865 to 1872, Dr. REYBURN, late surgeon U. S Volunteers, makes some valuable comparisons as to the alleged predisposition of the African race to certain types of disease. Comparison is made with the diseases (22,053 cases) of white refugees. Among the negroes there were 152,141 cases of remittent and intermittent fever, and the conclusion is reached that no difference in susceptibility to these fevers exists between the colored and the white people of the Southern States. In like manner the relative statistics disprove the statements commonly made concerning the extreme liability of the colored race to scrofula and pulmonary tuberculosis. The deaths from typhoid fever were 951, or nearly 25 per cent. of the cases treated, the high mortality being dependent upon the intestinal lesions. The death-rate from diarrhœa and dysentery was also high, which Dr. Reyburn ascribes to the ignorance of the colored people of the laws of hygiene and the use of improper articles of food. The colored freedman and the white refugee alike succumbed quickly to epidemic cholera. Under every variety of treatment about one-half of the patients died.

The remarkably small number of cases of delirium tremens among the negroes is charged by Dr. Reyburn to "the want of development of the cerebral hemispheres." "Delirium tremens is pre-eminently a disease causing disorder of intellection; and hence the continued abuse of alcoholic drinks in the negro race is more apt to produce epileptiform convulsions or mania than delirium tremens."

The conclusion is reached that the negro race does not withstand the attacks of acute inflammation, such as pneumonia; nor do they recover from long-continued illnesses, such as typhoid fever, so well as the white race; but, on the other hand, the negro's power of repair after injuries and following surgical operations is believed to be superior to that of the white.—*Med. News*, July 11, 1891.

**A Study of Consanguineous Marriages.**—There is a little Commune known as Fort Mardick, on the extreme northern coast of France, where nearly all the inhabitants are related to each other, almost all of them having sprung from four families who settled the place originally. As their neighbors were all of a different race (Flanders) it is very probable that most, it not all, of the early marriages in the community, were among blood relations, and even now 24 per cent. of the marriages are between cousins of not more than two removes. Such a community ought to furnish valuable material for a study of the effects upon the offspring of consanguinity among the parents, and indeed the study has been made by Drs. LOUIS and GUSTAV LANCRY, and reference to it we find in L'Union Médicale, No. 24, 1891.

These observers found that there had been 63 unions of this sort from 1882 to 1886, or more than 24 per cent. of the entire number—a very large proportion indeed, considering that the percentage in the whole of France is less than 3 per cent. Inquiry was made concerning each of these families with the result of revealing only two defects in the children. In one family there was a deaf mute and in another an idiot. The deaf mute had lost his hearing at the age of three years, but previous to that time had been able to talk as well as other children of his age. The mother of the idiot had met with a terrible accident, whereby she nearly lost her life while carrying the child—a fact which would probably have been accepted as a satisfactory explanation of the defect in case the parents had not been related. The Drs. Lancry endeavored to find out the effect of consanguineous marriages on fecundity. They found that of the total number of marriages in the Commune between the years 1882 and 1886 10.4 per cent. of the couples were sterile, while 4.3 per cent. had had but one child. Of the consanguineous marriages 16 per cent. were without fruit, and in 7.95 per cent. there had been an only child. As a result of their studies the authors came to the conclusion that the marriage of blood relations tends to the diminution of the birth-rate, but that it has no prejudicial influence upon the children that may be born in such union.—*Medical Record*, May 9, 1891.

## SANITARY SCIENCE.

**Self-Purification of Streams.**—MAX V. PETTENKOFER is now convinced that the chief factor in the cleansing of streams is not due, as formerly believed, so much to the settling of the suspended particles and the oxidation of the organic matter by means of the oxygen absorbed from the air, as to the plants and vegetable life of the water which act in the same manner as they do upon the land in a well-dunged field. As one can give a field too much fertilizer, it would follow that a stream may be given more offal than it can consume in a given length of time. At the request of the writer, experiments were made by Low and Bokorny on the nourishment and growth of the lower forms of plant life found in rivers. These experimenters found that the ordinary algæ flourished luxuriantly in water containing 1 per cent. of organic food, such as glycerin, creatine, and beatine, while the ratio of the water and fecal matter of Munich is .006 per cent. In order to quiet the fears of the inhabitants of Freising, a town situated on the Eiser, 33 kilometers below Munich, this celebrated water analyst makes the following statements: It is necessary to know what and how much material a stream can elaborate at its lowest low water-mark and not to supply so great an amount of material that the vegetable life cannot work it all up. This is dependent, not only upon the amount of water, but also upon the rapidity of the current. Both above and below Munich are found large amounts of low plant life, and notwithstanding the fact that more than half the fecal matter of Munich is dumped into the Eiser the water reaches Freising in a pure state. This would be the case even if the water when it left Munich would contain as large an amount of fecal matter as the Seine did before plans were undertaken for its purification. Precaution must be taken, however, to remove pieces of wood, cork, paper, leaves of plants, orange peel, etc., which the algæ, of course, cannot assimilate. In the experiments by Low it was found that in water which contained but a trace of phosphate, the ashes of the algæ contained a large quantity. This is analogous to the sea plants in whose ashes bromine and iodine were discovered before their presence was accurately determined in salt water.

**Shall we have a National Medical Secretary of Public Health?**—The Committee of the American Medical Association, appointed to consider the advisability of the United States Government having a department of Public Health, reported favorably the following resolution at the meeting held in Washington, May 7, 1891:—

*Resolved*, That the President of this Association appoint a committee of five to memorialize the next Congress for the purpose of creating a cabinet officer, to be known as the Medical Secretary of Public Health.

Numerous reasons for and against such a procedure will naturally at once suggest themselves.—*The Sanitarian*, June 1, 1891.

**Composition of Tuson's Disinfectant Powder.**—Tuson's disinfectant powder is composed of a mixture of sulphite of lime, sulphate of alumina and sulphate of zinc, the last body being well known as an efficient disinfectant and antiseptic. The first two bodies when moistened decompose one another and evolve sulphur dioxide ($SO_2$) according to the following reaction:—

$$3CaSO_3 + Al_2(SO_4)_3 = 3CaSO_4 + Al_2O_3 + {}_3SO_2.$$

Every pound of the powder gives off seven gallons of $SO_2$, according to the analytical records of the *Lancet*, July 4, 1891.

The advantages of having a powder of this sort, which will at once evolve such a powerful disinfectant as $SO_2$, is apparent to every one. This disinfectant is largely sold abroad, the ingredients being printed upon each package.

**The Living Earth.**—George Vivian Poore, President of the Section of Sanitary Science and Preventive Medicine, at the last Sanitary Institute held at Brighton, delivered an interesting opening address on "The Living Earth."

He tries to show that all excretion and waste matter should be returned to the earth from which they came, instead of being cast into the river and sea, as in our present way of disposing of the garbage of our large cities. He says that the mould which forms the upper stratum of the ground upon which we live is composed of organic matter and is teeming with life. This black vegetable mould is largely made up of excrement due, in a great part, to the unwearying labors of the earth-worm, probably the most important of all the animals inhabiting the soil. While the amount of animal life is considerable it is nothing in comparison with the richness of the soil in the lower forms of vegetable life as the saphrophytic fungi. By means of these micro-organisms and others of the same class, oxidation or even reduction is caused in organic matter. The vitrifying process may be produced by the bacillo-coccus of Frankland, but lately discovered, alone or to other microbes not as yet isolated. This mould forms a filter of the most perfect kind, as is shown by the fact that vegetable life tends to greatly diminish as we go down towards the deeper layers. The tenacity with which the mould retains water is due to the fact that millions of these vegetable cells absorb the moisture into their interior, and becoming swollen form an effectual barrier to the passage of bacteria. The question whether or not the bacteria hurtful to mankind are found in the soil is of the greatest importance. As elsewhere the survival of the fittest holds good, and organisms which flourish in the human body languish and cease to multiply in the soil which supplies conditions unsuitable for their multiplication or even survival. The coma bacillus of Koch has been much studied, yet it must still be considered as an open question whether or not this microbe is the cause of cholera. As easily as cultures of this bacillus are prepared they die when spread upon glass and exposed to the ordinary temperature, hence it is inferred that the transport of living coma bacillus, as in dust, through the air is impossible. If the coma bacillus come in contact with the saphrophytes, they are soon overcome either by their nutrient material being used up or by the production of poisonous products. Multiplication also probably never occurs in pure running water, while they may increase in bilge water, or even in the waters of harbors. The best way therefore to get rid of the coma bacillus, as in injecta, is to dry them and expose the dried mass with the saphrophytes. Now if the dejecta of a patient suffering from cholera be mixed with water and be taken by means of an impermeable pipe through the surface to a mineral sub-surface where there is no sun to dry or saphrophytes to destroy the microbe, the danger of their getting into our drinking water is great. This living mould of the surface and dead earth of the sub-soil have not been sufficiently well distinguished between. Our only efficient scavenger lies in the living mould, which should be kept in a healthy condition by means of an early return to the soil of all organic matter. If these facts be applied to the prevention of the pollution of our water supply, it will be seen that while the present panacea for all sanitary ills has been drainage and dilution we but increase rather than diminish the danger of infection through excreta. The mixing of excremental matter with water is the one common factor for all the outbreaks of typhoid fever in the statistics prepared by F. W. Willis for the writer.[1] Typhoid is stated not to have been recognized in this country until the invention of the water-closet. The dangers which result from the putrefaction of a mixture of excretion and water in a sewer and cesspool are so great that the following reasons are given for the keeping of the excremental matters from the sewers:—

1. Excrement is the only ingredient of sewage against which dangerous infectious properties have been proved again and again.

2. The old practice of having our household slops to run in open gutters could be revived in the country, and the gutters might be subject to the wholesome discipline of the broom and the purifying influences of sun-light and drying winds.

3. The volume of sewage would be diminished at least one-fifth. The manurial value of the human excrement thus saved would be enormous. The composition of the average sewage is so variable, and is so often nowadays filled with antiseptics, that its value as a fertilizer is often on the minus instead of the plus side.

It is the writer's firm conviction after a practical experience of nine years that the disposal of the sewage in the way and manner about to be described is so desirable from every point of view, scientific, sanitary, moral, and economical, that he cannot too strongly impress upon the dweller in the country that he should be warned by the towns and revert to the cleanly and decent habits of our forefathers, and keep the sanitary offices away from the main structure of the house. Poore advises all solid matters to be kept out of the house drains by means of a strainer, and to have them decently buried each day in the living earth. Drains are replaced by gutters, and the household slops are filtered and applied to the top of a different piece of cultivated land every day. Even in the city the accumulation of fæcal matter is taken to the country and directly applied to the soil. We are told by Acland that the disappearance of the great cities of antiquity was due rather to pestilence than to war. In this respect the Chinese should be studied: they were a great nation in the time of Moses, and have seen many people come and go, and if we do not mend our ways they will see us out as a nation. In China nothing is wasted; all organic refuse is ultimately returned to the soil. While we should not follow them in many of their filthy habits, in this we should learn a lesson. A nation that fouls its streams and starves its soil is in danger of poisoning and inanition, and a nation which imports a great part of its food and a great part of its manure, and systematically and by act of parliament throws all its organic refuse into the sea is undoubtedly living upon its capital. Our capital just now is considerable, but we are in a free way to run through it, and when we have done so who can predict the future?—Transactions of the Sanitary Institute, vol. xi., Congress at Brighton, 1890. Book published, 1891.

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[1] An elaborate table showing the different outbreaks of typhoid fever in England has been prepared by Willis, and is added as an appendix to the report.

# THE CLIMATOLOGIST.

## A MONTHLY JOURNAL OF MEDICINE.

VOL. I. OCTOBER 15, 1891. No. 3.

"INTRODUCTION.

"The object of this JOURNAL is to promote original investigation, to publish papers containing the observations and experience of physicians in this country and Europe on all matters relating to CLIMATOLOGY, MINERAL SPRINGS, DIET, PREVENTIVE MEDICINE, RACE, OCCUPATION, LIFE INSURANCE, AND SANITARY SCIENCE—and in that way to supply the means by which the general practitioner and the public at large will become better acquainted with the diseases of this country and Europe, and better armed to meet the requirements of their prevention or cure. The study of these subjects in this country is exciting great and increasing interest, and all admit that, from the little knowledge already possessed of its resources, possibly every known combination of atmospheric condition, soil, altitude, climate, or mineral springs, is to be found on this continent. It is confidently expected that *a journal devoted to the study of all diseases into which climate, soil, race, occupation, hereditation, diet, contagion, etc., enter more or less as factors*, will receive the encouragement of all, and become eventually an authority upon all subjects which are included in its title, although a thorough review of all progress in the departments mentioned will not be neglected. Especial attention will be given to the publication of *original material*, and it is to be hoped that physicians of all sections of the country will send papers upon any subjects which will be of general interest—such as the diseases of their locality—those incident to occupation, race, or climate, the study of epidemics, the questions of proper food, of the water supply, its potability and distribution, and all matters relating to drainage and diseases dependent on it.

"Original papers based upon experimental studies, or laboratory investigations in bacteriology, will form a prominent portion of the material presented during the year.

"Special attention will also be paid to the subject of health resorts, descriptions of Sanitariums with special reference to their suitability to certain cases, and the proper selection of patients to be benefited by different resorts. The utmost care will be taken that this JOURNAL shall assume and maintain the highest scientific character. It will be absolutely independent in its principles—*fair towards all.* It will depend for its maintenance upon the support given to it by the profession, as it is not published in the interest of any special section or clique."—*August*, 1891.

# THE CLIMATE OF FLORIDA.

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THE Florida peninsula is about three hundred miles long, and embraces nearly five degrees of N. latitude. Its trend southward is a little southeast. Its average width is about one hundred and thirty miles. With the exception of the St. John's, there are no large navigable rivers on the peninsula, though a number of small rivers are found on the western coast, which empty into the Gulf of Mexico. The most southern third of the peninsula is low and level, and a large part of this lower third is comprised in what is known as the Everglades—extending from, around and south of Lake Okechobee. This Everglade region is filled with sluggish streams and lagoons and covered with saw-grass, with an occasional oasis in the shape of a low cabbage hummock or cypress swamp. At least such are the descriptions usually given by those who have visited the Everglade region, the writer having never been farther south on the peninsula than the south banks of the Caloosahatchie River, which flows from Lake Okechobee into the Gulf of Mexico.

The topography of the Florida Peninsula is peculiar in the fact of its greatest altitude being below the 29° of latitude, as is evidenced by her principal streams flowing in a northerly direction—the St. John's on the eastern slope and the Withlacooche on the western slope. An elevated ridge or backbone extends down the peninsula to about the 27° of latitude; and this ridge or water-shed is probably one-third nearer the Gulf coast than it is to the Atlantic coast. The altitude of this ridge is from one hundred to three hundred feet, and in some places is much broken by lakes and sand-hills. The surface of the water-shed and its western slope is undulating and somewhat hilly, and is not a dead level, as many who have never visited the State, or have only seen the eastern side, along the St. John's and Indian rivers, suppose.

The soil of the peninsula is, as a rule, sandy, very porous in hilly or undulating sections, but finer and more compact on level reaches. The character of the subsoil hardpan varies greatly in different localities, being sometimes clay and sometimes lime-rock, at variable depths of from only a few to ten or more feet from the surface. In the two last years extensive deposits of phosphate rock have been discovered in various localities on the western slope of the peninsula above the 28th parallel of latitude, while larger deposits of bone phosphate, in the shape of pebbles or nodules, are found in the streams south of the 28th parallel. It is not probable, however, that as yet the extent of this valuable deposit has been fully explored. The origin or genesis of this rock-phosphate seems to puzzle the geological savants, though the bone-phosphate found in the streams and also in the earth lower down the peninsula, is evidently from fossil remains of extinct animals, probably of marine variety.

The surface of the country is broken by lakes, hummocks, swamps, and savannas, though these are not of any great extent, except in the most southern part of the peninsula. The savannas are generally converted into shallow lakes or ponds by the rains of the summer and early autumn; and during the dry season of winter and spring the water in many of the lakes falls quite low. The waters of the rivers are supplied by both surface drainage from lakes and swamps where the rain-water collects, and also by subterranean springs. In fact, subterranean springs are quite common in Florida, and some of these are noted for their great extent, depth, and clearness. In some instances the volume of water emitted by the springs is so great as to form a small river, with a clear, swift current. Some streams thus originating flow into the St. John's River, while others empty into the gulf. And in this connection it may be as well to mention the fact that in some sections, especially those of more than ordinary undulating character, considerable areas of territory are drained of the superfluous rainfall by subterranean passages which probably conduct the water into the beds of rivers or into the gulf or Atlantic. What final disposition is made of the water which finds its way into the subterranean conduits is only a matter of conjecture. It is very evident, however, that the springs before spoken of are not supplied by this subterranean drainage, as neither wet nor dry weather affects them.

The fertility of the soil varies greatly, and with it the natural growth on it. On the hummock lands are found most of the hard woods of the other Southern States; in the swamps cypress, and red cedar in some, cabbage palmetto, and a great variety of scrub-growth. On the pine lands are the pines, a variety of bushes of various kinds, and in some places the scrub, or saw palmetto. It is the hummock lands which afford the most fertile soil for farming purposes, though sometimes a very fairly productive soil is found on the pine lands. When the surface is much undulating from being more or less hilly, the pine lands possess, as a rule, a very open, porous soil, not well adapted for general farming, because of lack of natural fertility and its want of moisture in the dry season of winter and spring. With some fertilizing and irrigation this class of lands has been found well suited for orange orchards, and by the same means can be cultivated profitably in the production of early vegetables.

As to natural healthfulness, Florida can compare favorably with any of her sister States in the Union. Malarial fevers are by no means so common nor universal in her borders as many suppose. Malarial fevers may and do prevail in certain sections and localities, while other sections and localities are comparatively or wholly exempt. As a rule, it will be found that those sections and localities having the most fertile soil are the most obnoxious to the prevalence of malarial fevers. It does seem, however, that within the last two decades malarial fevers have been on a steady decline even in the more sickly regions, which, in the writer's opinion, may be largely attributed to the extensive cultivation of the orange tree within that period. Whether this is the result of an anti-malarial property of the tree, or is due to a more thorough drainage of the soil by a perennial tree with a heavy foliage of large leaves, it may not be easy to determine. The use of the roots and leaves of the citrus family as a cure or preventative of malarial fevers in Southern Italy and Northern Africa is, however, a common domestic practice, according to Tomasi Crudelli.[1] Moreover, within the memory and professional experience of the writer, the malarial fevers of Florida have become much milder and more amenable to treatment. Very rarely, indeed, is the algid, or congestive, type met with; whereas such cases were not uncommon twenty-five or thirty years ago; and, according to the reports of the medical officers of the U. S. Army, during the various Seminole wars from 1835 to 1854, the algid, or congestive, type of malarial toxæmia was not infrequent. In all other respects the salubrity of Florida is first-class; and while her coast cities and towns may be exposed to the danger of occasional epidemics of yellow fever during the hot season, she is not without compensation in an almost total exemption from diphtheria and the slight mortality attending such exanthematous diseases as measles and scarlet fever, owing to the mildness and general equability of her climate.

So much has been deemed necessary as to the general healthfulness of the country in order to disabuse the public mind of the erroneous impression largely obtaining outside of the State, that the Florida Peninsula is naturally sickly, and that every resident suffers annually, if not perennially, with malarial toxæmia in some form; so also as regards the natural features of the country, to correct the too common prevailing opinion beyond her borders, of the Florida Peninsula being but little else than swamps and malaria-breeding cesspools. Even in the lower part of the peninsula where extensive dredging operations have been carried on for several years by a Philadelphia company under contract with the State, for the purpose of reclaiming large areas of overflowed and low lands, it has been noted that the employés engaged in the work have been practically exempt from malarial fevers. These dredging operations have been mainly carried on upon the Kissimee and Caloosahatchie rivers, the former flowing south by east into Lake Okechobee, and the latter west from Lake Okechobee into the Gulf of Mexico.

CLIMATE.—Climate is the result of meteorological conditions as to temperature, rainfall, relative and absolute humidity of the

[1] Address before the International Congress at Copenhagen.

atmosphere, and the form and direction of the winds. These constitute the main meteorological phenomena of climate; though the altitude and surface of the country, and the proximity of mountain ranges or the open sea are important factors in affecting it. These latter topographical conditions have consequently great influence in modifying the climatic conditions, and necessarily confer on nearly every extensive territory climatic peculiarities of its own, independent of mere geographical position as regards latitude. Again, the littoral climates of continents are greatly modified by the oceanic currents; and because the warm equatorial surface currents of the ocean in flowing north attain an eastward course in the higher latitudes, owing to the diminished diameter of the earth, and the waters retaining the eastward momentum of velocity of the torrid zone, these warm oceanic currents lave the western shores of continents, and transfer to them much of the heat thus translated from the torrid region of the equator. The reverse of this is true as regards the deep cold Arctic currents flowing south; for as these deep cold currents reach the lower latitudes, they attain a westward tendency on account of the increased diameter of the earth, and, consequently, shoal up on the eastern shores of continents, and thereby lower the temperature of eastern littorals; and thus is explained the fact of milder climates being always found on the western shores of continents. For instance, this is illustrated by the annual mean temperature of New York City and Portland, Oregon. The latitude of New York City is 40° 43′ N., with a mean annual temperature of 51.9°; while the latitude of Portland is 45° 32′ N., and has a mean annual temperature of 52° F.; so that New York City and Portland, Oregon, are practically isothermal, although New York is almost 5° of latitude farther south.

The above represents the year 1888, but the annual mean for the four years from 1886 to 1889 inclusive, gives Portland 53.1° F. and New York 50.6° F., so that the isothermal for the year of New York is about five degrees of latitude farther north on the Pacific coast. This difference of temperature is without doubt due to the oceanic currents as before explained. Tampa, near the 28th parallel of latitude and located near the Gulf Coast of the Florida Peninsula, has about the average temperatures of Cairo in

Egypt, although Tampa is two degrees farther south; and Canton in China, and Key West are in the same latitude; and, although a fall of snow in Canton is a rare occurrence, the lowest recorded fall of temperature in Key West was to 42° F.

Quite a number of articles on the climate of Florida have been written in recent years, in which the writers lay great stress on the ameliorating effects of the warm waters of the Gulf Stream, which is found a few hundred miles off the east coast of the peninsula. In the writer's opinion, not much weight is to be attached to this claim from the fact that the U. S. coast surveys clearly demonstrate, that the deep Arctic currents flowing south, shoal up on the peninsula coast inside of the Gulf Stream. As a natural result of this deep cold water shoaling up between the Gulf Stream and the peninsular littoral, the superjacent air must be deprived of any small modicum of increasing temperature derived from the Gulf Stream by the time it reaches the peninsula. Another circumstance has also contributed to this general, though erroneous, belief, based on the meteorological observations made at the various military posts in the Florida Peninsula from 1839 to 1854, and published by the Surgeon-General in 1854 and 1860. Many of these old meteorological tables embrace only a few years, and in many instances the observations were only partly complete for the several years respectively. Thus at New Smyrna, on the eastern coast, the summary of the observations represents four years; whereas the truth is that the observations are complete for one year only. From the meteorological observations made at the various military posts of the United States, Hon. Lorin Blodget obtained his data for his excellent work on the Climatology of the United States, but the data being misleading, it is very evident that the conclusions deduced therefrom must be defective; and probably no section of the country has had this erroneous claim as regards the effect of the Gulf Stream on the climate of the eastern coast of the peninsula, more persistently reiterated in its behalf. If, as this investigation progresses, it is found that the eastern coast of the peninsula possesses any advantage in a slightly higher mean temperature over points in the same latitude on the western side, it will be demonstrated to be due to other causes than that of the Gulf Stream.

Other general considerations pertaining to, and affecting climatic conditions, are the sudden changes in the barometrical pressure of the atmosphere. Areas of low pressure generally occasion storms and bad weather; and these are frequently followed by areas of high pressure, which almost invariably in winter produce cold waves.

"These atmospheric disturbances are easily divided into two classes—cyclonic or low-area storms and anti-cyclonic or high-area storms.

"By a cyclonic storm is not necessarily meant a cyclone or hurricane, but a storm characterized by a pressure below the average, and having a wind system blowing spirally inward, as do the winds of a genuine cyclone. . . . . .

"To summarize, low area storms have a wind circulation inward, and upward, are elliptical in form, in the United States, generally, have their major axis from W. S. W. to E. N. E., have a mean velocity varying from 600 to 900 miles each day, move in the same general direction, probably, as the upper air currents, usually toward a point varying a little from due east, are characterized in their eastern quadrants by cloudy weather, southerly and eastern winds, precipitation, temperature, oppressive in summer and abnormally high in winter, falling barometer, increasing humidity; and followed by clearing weather, rising barometer, decreasing humidity, and falling temperature in the western quadrants. These latter changes are more decided in the United States than in Europe, since in this country the air drawn in behind the depression is a cold, dry current from the comparatively high pressure area of sub-arctic America."[1]

It will thus be seen that, as a rule, all marked departures from the ordinary normal temperatures of a section of country or of a locality, are due to atmospheric disturbances; and especially those occasional marked depressions of temperature during the winter season, to the diffusion of high pressure areas from the northwest, after the subsidence of the low-area pressure, attended with bad weather. The ulterior causes which bring about these atmospheric disturbances are not fully known. The equability of any climate is consequently more or less affected by these anti-cyclonic or high-area storms. The most noted one of these in recent years was that of the first part of January in 1886. "At that time the

[1] American Weather, by Gen. A. W. Greely.

entire country to the eastward of the Rocky Mountains was affected by temperatures ranging from thirty degrees below zero over Canada to thirty degrees above zero at Brownsville, Tex. There was no portion of Florida, from which reports were received, but what experienced freezing temperatures and hard frosts, and only the extreme southeastern part of the State escaped injury. At Key West the temperature fell to forty-two degrees, the lowest ever recorded.

"Galveston Bay froze over on the 9th, and snow fell through all southern Texas, from San Antonio southward to Brownsville, it being the first general snow in that region since 1866. At Pensacola, Fla., fresh-water ice formed to the thickness of three inches, and sea-water froze along the edge of the bay. In Florida, at Manatee, Live Oak, Lake City, Cedar Keys, and Tampa, ice of considerable thickness formed.

"The anti-cyclone of January, 1886, was the most noteworthy one for many years, as it induced in the Gulf States the lowest temperatures ever recorded, although a similar storm of about the same severity occurred in 1835."[1]

In the anti-cyclone of 1835, the thermometer is said to have fallen to 11° F. at Fort King, latitude 29° 5′ N., and to 7° F. at St. Augustine, and that "all kinds of fruit trees were killed, and extensive orange groves were destroyed." If this is correct, it is probably the most extreme cold ever experienced in Florida. In January, 1886, the thermometer fell to 14° F. at Pensacola, and to 16° F. at Cedar Keys. No reliable records at other points are to be found within the writer's reach.

While the average normal temperature is dependent on insolation and radiation, sudden and marked departures from the average normal are wholly dependent on atmospheric disturbances which, so far, science does not enable one to foresee or predict much over twenty-four hours before their occurrence. So that these rather sudden and marked depressions of temperature are the result of the anti-cyclone or high-area pressure air from the cold regions of the North pouring down in a body, as it were, into these southern latitudes, and then the cold is one of translation; and of course the probability of this cold wave striking Florida is

[1] American Weather, by Gen. A. W. Greely.

wholly dependent upon the direction of the anti-cyclones whose usual direction is generally too much to the eastward to reach the Florida Peninsula; though at rare, and mostly at very long intervals, the anti-cyclones do reach the peninsular portion of the State. Only in recent years, however, since orange growing and the cultivation of early spring vegetables for the northern markets, have become very prominent industries, has much note been taken of these cold snaps, as they are generally called. In the fall of 1888, when the yellow fever epidemic was subsiding, it was really amusing to note how localities hitherto claiming to be below the frost line, were announcing over the telegraph wires the early presence of heavy frosts and the formation of ice.

The following table of the mean temperature for each month and season, and for the year, is, as will be seen by reference to the right-hand margin, compiled from the Signal Service Reports and the U. S. Army Medical Reports published in 1856. The largest period represented by the S. S. Reports is nine years for Pensacola, Jacksonville, Cedar Keys, and Key West; Sanford and Punta Rassa two years; Jupiter and Titusville only one year. Even some of the S. S. Reports do not represent the same years, and the same fault is attached in some instances to the Military Post Reports, so that for purposes of comparison between the different localities the value of the table is somewhat impaired; while, nevertheless, it fairly indicates the mean normal temperature of each locality named.

St. Augustine, Titusville, Jupiter, and Fort Dallas are on the Atlantic Coast. Key West is an island about 60 miles from the main land. Its climate is entirely a marine one and deserves little consideration as bearing on the climate of the main land. Pensacola, Cedar Keys, and Punta Rassa are on the Gulf Coast. Jacksonville is on the St. John's River, about 30 miles from its mouth into the Atlantic. Palatka is also on the St. John's River 75 miles from Jacksonville, and about 25 miles southwest of St. Augustine. Sanford is on Lake Monroe, St. John's River, and about 35 miles from the Atlantic. Tampa is at the head of Hillsborough Bay, the eastern division of Tampa Bay, and is about 25 miles from the Gulf Coast. Fort Meade is on Peace Creek, and is about 60 miles from the Gulf Coast. Fort Meyers is on the Caloosahatchie River, 15 miles from the Gulf.

*Table of mean temperature (Fahr.) for each month, season, and year, from observations at various points in Florida for a series of years.*

| STATION. | Position of station. Lat. | Long. | Alt. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Spring. | Summer. | Autumn. | Winter. | Year. | Date. | AUTHORITY. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | feet | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | | |
| Cedar Keys . . | 29° 07′ | 83° 03′ | 35 | 56.5 | 61.4 | 62.8 | 70.0 | 75.8 | 80.5 | 82.3 | 81.8 | 79.5 | 73.0 | 63.4 | 57.2 | 69.5 | 81.5 | 71.6 | 58.3 | 70.2 | 1880–'89 | Signal Service. |
| Jacksonville . . | 30 15 | 82 | 14 | 56.2 | 60.7 | 62.0 | 69.5 | 75.2 | 80.8 | 83.0 | 81.8 | 78.3 | 71.8 | 62.2 | 56.5 | 69.1 | 81.8 | 70.7 | 57.8 | 79.8 | " | " " |
| Key West . . . | 24 32 | 81 48 | 10 | 70.9 | 72.3 | 73.1 | 76.8 | 77.8 | 83.2 | 85.1 | 84.6 | 82.8 | 79.2 | 74.8 | 70.2 | 76.5 | 84.2 | 78.9 | 71.1 | 77.6 | " | " " |
| Pensacola . . . | 30 18 | 87 27 | 20 | 52.6 | 57.6 | 60.4 | 67.8 | 74.3 | 80.0 | 81.8 | 81.2 | 78.0 | 70.4 | 59.2 | 53.8 | 67.5 | 81.0 | 62.5 | 54.6 | 66.4 | " | " " |
| Sanford . . . . | 28 48 | 81 23 | — | 57.6 | 57.9 | 62.0 | 68.5 | 74.6 | 78.8 | 78.8 | 79.6 | 78.9 | 71.5 | 62.2 | 56.7 | 68.1 | 79.0 | 70.8 | 57.4 | 69.0 | 1886–'87 | " " |
| Titusville . . . | 28 34 | 80 51 | — | 62.5 | 63.7 | 63.4 | 71.6 | 75.3 | 78.7 | 80.8 | 81.8 | 78.4 | 72.5 | 65.6 | 56.7 | 70.1 | 80.4 | 72.1 | 60.9 | 70.9 | 1889 | " " |
| Jupiter . . . . | 26 57 | 80 7 | — | 68.4 | 68.4 | 68.1 | 72.9 | 76.3 | 79.4 | 81.0 | 82.5 | 79.8 | 76.5 | 70.4 | 62.8 | 72.4 | 80.9 | 75.5 | 66.5 | 73.9 | 1889 | " " |
| St. Augustine . | 29 48 | 81 35 | 20 | 57.0 | 59.9 | 63.3 | 68.8 | 73.5 | 79.3 | 80.9 | 80.5 | 78.6 | 71.9 | 64.1 | 57.2 | 68.5 | 80.3 | 71.5 | 58.1 | 69.6 | 1824–'52 | Mean of 20 years. U. S. Military Post. |
| Pilatka . . . . | 29 34 | 81 48 | 25 | 57.2 | 58.3 | 64.1 | 71.2 | 76.6 | 80.3 | 81.2 | 80.2 | 78.6 | 70.5 | 61.5 | 56.0 | 70.6 | 80.6 | 70.2 | 57.2 | 69.6 | 1838–'43 | " " |
| Fort Dallas . . | 25 55 | 80 20 | 20 | 66.4 | 66.6 | 70.4 | 75.6 | 78.0 | 80.5 | 82.1 | 81.8 | 79.6 | 77.9 | 71.3 | 66.8 | 74.7 | 81.5 | 76.3 | 66.6 | 74.7 | 1839–'41 1850–'55 | " " |
| Fort Myers . . | 26 38 | 81 00 | 10 | 63.4 | 68.0 | 72.2 | 73.8 | 80.1 | 81.2 | 82.9 | 83.1 | 81.7 | 77.7 | 71.5 | 64.7 | 75.4 | 82.4 | 77.0 | 65.3 | 75.0 | 1851–'54 4 years. | " " |
| Tampa . . . . | 27 57 | 82 28 | 20 | 61.5 | 63.5 | 67.7 | 71.8 | 76.6 | 79.5 | 80.7 | 80.4 | 78.3 | 74.0 | 66.9 | 62.0 | 72.0 | 80.2 | 73.4 | 62.3 | 72.4 | 1825–'54 20 years. | " " |
| Fort Meade . . | 27 50 | 82 00 | 80 | 58.4 | 63.2 | 69.0 | 69.9 | 76.7 | 78.2 | 79.8 | 80.0 | 79.2 | 73.8 | 68.5 | 61.1 | 71.9 | 79.3 | 73.8 | 60.9 | 71.5 | 1851–'54 | " " |
| Punta Rassa . . | 27 00 | 82 18 | 5 | 62.3 | 67.5 | 68.1 | 73.3 | 77.4 | 79.8 | 79.9 | 81.7 | 79.0 | 74.0 | 66.1 | 64.1 | 72.9 | 80.3 | 73.0 | 64.6 | 72.6 | 1873–'74 | Signal Service. |

*Table of maximum and minimum temperature (Fahr.) for the year* 1888, *and the annual range as observed at twelve different places.*

| Station. | Jan. | | Feb. | | Mar. | | April. | | May. | | June. | | July. | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | Annual range. | Authority. | Observer. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | | | |
| Alva, on Caloosahatchie River | 82° | 37° | 84° | 43° | 86° | 40° | 86° | 62° | 90° | 64° | 93° | 67° | 92° | 71° | 94° | 71° | 93° | 66° | 96° | 55° | 88° | 34° | 81° | 29° | 67° | S. S. Report for 1889. | Chas. E. Robins. |
| Archer, lat. 29° 40′ | 85 | 22 | 82 | 32 | 90 | 32 | 94 | 42 | 97 | 52 | 104 | 55 | 102 | 65 | 101 | 67 | 100 | 52 | 94 | 42 | 94 | 29 | 82 | 23 | 82 | " " " | Dr. J. C. Neal. |
| Cedar Keys . . | 77 | 29 | 73 | 33 | 74 | 37 | 81 | 55 | 86 | 63 | 89 | 66 | 91 | 71 | 91 | 71 | 91 | 55 | 88 | 56 | 88 | 43 | 70 | 32 | 62 | " " " | |
| Fort Meade . . | 83 | 36 | 85 | 43 | 88 | 38 | 88 | 59 | 91 | 65 | 94 | 74 | 97 | 76 | 95 | 78 | 92 | 68 | 91 | 52 | 87 | 34 | 80 | 27 | 70 | " " " | A. H. Adams. |
| Jacksonville . . | 81 | 28 | 82 | 32 | 84 | 35 | 88 | 49 | 93 | 56 | 96 | 64 | 98 | 68 | 96 | 67 | 92 | 55 | 86 | 50 | 88 | 38 | 74 | 28 | 70 | " " " | |
| Jupiter . . . . | 83 | 45 | 85 | 47 | 83 | 45 | 88 | 59 | 88 | 62 | 89 | 68 | 94 | 69 | 90 | 72 | 89 | 67 | 86 | 61 | 83 | 43 | 78 | 36 | 58 | " " " | |
| Key West . . . | 81 | 58 | 80 | 59 | 82 | 58 | 82 | 64 | 85 | 66 | 89 | 73 | 90 | 68 | 91 | 71 | 89 | 71 | 85 | 66 | 84 | 58 | 79 | 52 | 39 | " " " | |
| Manatu, lat. 27° 30′ | 83 | 36 | 88 | 42 | 90 | 42 | 92 | 50 | 93 | 53 | 94 | 62 | 94 | 73 | 94 | 74 | 92 | 65 | 92 | 55 | 90 | 38 | 83 | 34 | 60 | " " " | Mrs. Mary W. Roberg. |
| Pensacola . . . | 71 | 26 | 70 | 32 | 76 | 38 | 78 | 54 | 85 | 58 | 88 | 64 | 94 | 72 | 91 | 70 | 89 | 54 | 83 | 51 | 81 | 34 | 68 | 28 | 68 | " " " | |
| St. Augustine . | 79 | 30 | 78 | 36 | 85 | 38 | 86 | 52 | 85 | 61 | 94 | 63 | 92 | 69 | 93 | 71 | 83 | 61 | 84 | 53 | 84 | 40 | 73 | 29 | 65 | " " " | U. S. Post Hospital. |
| Tallahassee . . | 78 | 25 | 75 | 30 | 83 | 31 | 88 | 52 | 91 | 57 | 92 | 66 | 93 | 71 | 92 | 70 | 91 | 49 | 86 | 48 | 82 | 33 | 74 | 25 | 68 | " " " | Rev. W. H. Carter. |
| Titusville . . . | 80 | 36 | 81 | 38 | 87 | 41 | 87 | 56 | 88 | 62 | 93 | 60 | 95 | 68 | 91 | 69 | 90 | 58 | 88 | 53 | 84 | 39 | 75 | 32 | 63 | " " " | |

From the table of maximum and minimum temperatures for each month, it will be observed that even in winter the maximum in each of the three months of that season, ranges from 70° to 83° F.; and that the minimum for the winter ranges from 22° to 36° F., according to latitude, except at Key West, whose extreme southern and insular position can hardly be taken as indexical of the climate of the mainland.

Alva is on the Caloosahatchie River, in the latitude of Fort Meyers, and about 35 miles from the Gulf. Archer is in Alchua County, on the railroad from Gainesville to Cedar Keys, and is about 35 miles northeast of the latter. Manatee is on a river ot the same name, and is about 40 miles south of Tampa, and 12 miles from the Gulf of Mexico. The latitude of Manatee is 27° 20′. Tallahassee is the State capital, in the section of the State known as Middle Florida. This town is about 25 miles from the Gulf and its latitude is 30° 20′ N. The geographical positions of the other places have already been designated in connection with the table of mean temperatures.

The table of maximum and minimum temperatures represents only one year; and, therefore, it must be remembered that all years are not represented by these figures.

The mean daily range of temperature for the several months of the year is not high for any part of Florida, and this becomes less as the peninsula is descended, as will be observed on comparing Punta Rassa and Key West with the other points. It will also be observed that it is somewhat greater at Jacksonville and Sanford which are interior points, although situated on extensive bodies of fresh water, than at the other points which are on the coast. It is a matter of regret that there are no data for points on the eastern coast and at elevated points in the interior.

On the approach of an anti-cyclone the temperature sometimes falls from ten to thirty degrees within twenty-four hours; though the change is never so abrupt as it is represented to be in Texas.

*Mean daily range of temperature (Fahr.) for each month of the year* (1886).

| STATION. | Jan. | Feb. | March. | April. | May. | June. | July. | August. | Sept. | Oct. | Nov. | Dec. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cedar Keys . . | °14.4 | °14.3 | °11.1 | °14.5 | °10.8 | °11.8 | °9.7 | °12.1 | °13.5 | °15.7 | °20.0 | °14.3 | Signal Service. |
| Jacksonville . | 16.2 | 16.7 | 13.9 | 15.6 | 18.1 | 14.8 | 14.8 | 14.2 | 11.9 | 15.4 | 23.0 | 18.5 | " " |
| Key West . . . | 9.2 | 9.5 | 9.2 | 9.8 | 9.5 | 14.2 | 15.0 | 12.2 | 12.1 | 7.5 | 7.9 | 9.3 | " " |
| Pensacola . . . | 14.3 | 16.2 | 13.2 | 13.8 | 13.8 | 12.6 | 12.3 | 13.3 | 12.2 | 16.7 | 18.4 | 16.7 | " " |
| Sanford . . . . | 17.1 | 19.2 | 16.2 | 16.0 | 19.7 | 17.9 | 15.7 | 15.7 | 13.3 | 11.3 | 19.2 | 18.1 | " " |
| Punta Rassa . | 13.0 | 13.5 | 13.9 | 11.0 | 10.0 | 7.0 | 6.0 | 8.5 | 7.0 | 10.9 | 12.0 | 11.0 | " " 1873 |

The mean annual rainfall for Florida is about fifty-five inches; though deviations from the average are in the direction of excess rather than of deficiency. By examining the table it will be seen that the least rainfall is in January, and then in April and May and March in the order named. That of February exceeds January, April, May, and March. The old Army Reports, however, do not show such excess for February as is represented in the accompanying table for 1888. The summer is the rainy season of Florida, and especially of the peninsular portion. The precipitation occurs in the form of showers of variable duration of from one to several hours. Sometimes several showers occur in the same day, the sun often shining hot and bright between them. Continuous rainy days are not a common occurrence south of the 29th parallel of latitude, while the northern part of the State participates, as would naturally be expected, in the climatic characteristics of the southern sections of the two contiguous States, Georgia and Alabama. There are great irregularities, however, in the amount of rainfall in Florida for different years; and, as already remarked, deviations from the mean are in excess rather than in deficiency. For instance, the mean at Tampa (Ft. Brooke) for 11 years is 55 inches. In 1840, the rainfall at Tampa was 89 inches, and in 1854, 69 inches; yet the minimum annual rainfall at Tampa has never been below 40 inches during the same period of observation. There appears to be a somewhat diminished rainfall on the coast as compared to interior points on the peninsula. The rainfall in Florida is not evenly distributed as to the several months nor the seasons, and especially is this the case south of the 29th parallel of N. latitude, but is so excessive in the summer and early autumn as to cause some to denominate the hot season the rainy season.

Blodget says: "There is a marked tendency toward the development of a winter-day season, even in the States next to Florida, and in southern Florida this is quite decided, and almost as fully developed as in the recognized tropical climates. As before remarked, however, there are great irregularities, and often quite contradictory results for single years. . . . . The most prominent feature of rain distribution in Florida, in distinction from other parts of the United States, is this great irregularity, which prevents us from getting clear, general views from periods embracing but two or three, or a few years. . . . . The first approach of this dry season is made in October, and from the minimum, which appears to occur in November, there is a partial resumption of the rains apparent in mid-winter, to be followed by other months of less rain. But as a whole, the winter from October forward is a dry season on the Peninsula of Florida. It appears to be a climate ordinarily of a division into two principal seasons in regard to the rains, the wet summer and the dry winter, yet either may be interrupted by the extremes of an opposite character much greater than those occurring in any other known district. . . . . Beyond the plains the characteristic features of the districts of periodical rains are strikingly exhibited, and southern Florida gives strong evidence that it should be identified with the districts of periodical rains rather than with the area of constant precipitation of the eastern United States. . . . . The south of Florida alone gives as soft a climate for the winter as that of the south coasts of the Mediterranean, and at a point far enough south to do so, the tropical features of a dry winter and rainy summer become instituted. At Tampa the average temperatures are nearly those of Cairo, Egypt, and the difference of latitude is two degrees."

*Monthly and annual precipitation (in inches and hundredths) for 1888, from Signal Service report.*

| Station. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. | Authority. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alva . . . . . . . . | 0.10 | 4.25 | 1.10 | 2.00 | 5.35 | 11.36 | 5.95 | 8.34 | 11.82 | 5.46 | 4.56 | 2.60 | 62.89 | C. E. Robins. |
| Archer . . . . . . | 0.87 | 5.41 | 1.34 | 1.33 | 9.16 | 1.97 | 3.74 | 5.91 | 10.82 | 5.02 | 7.61 | 4.49 | 57.89 | Dr. J. C. Neal. |
| Cedar Keys . . . . | 0.77 | 3.78 | 0.94 | 0.09 | 1.70 | 4.86 | 4.11 | 2.26 | 12.89 | 2.43 | 5.43 | 3.87 | 43.13 | Signal Service. |
| Fort Meade . . . . | 0.15 | 3.95 | 2.70 | 0.35 | 6.05 | 3.75 | 4.45 | 5.60 | 9.90 | 3.20 | 4.25 | 6.70 | 51.05 | A. H. Adams. |
| Jacksonville . . . . | 0.49 | 4.38 | 1.57 | 0.93 | 5.46 | 2.92 | 8.30 | 4.89 | 11.15 | 6.00 | 4.16 | 2.88 | 53.13 | Signal Service. |
| Jupiter . . . . . . | 1.50 | 3.27 | 1.25 | 4.08 | 8.86 | 5.52 | 3.72 | 4.44 | 8.72 | 3.78 | 3.98 | 3.26 | 52.38 | " " |
| Key West . . . . . | 0.37 | 0.51 | 0.91 | 1.15 | 2.65 | 0.88 | 9.04 | 2.00 | 5.45 | 3.42 | 4.74 | 4.46 | 35.58 | " " |
| Manatee . . . . . | 0.30 | 6.82 | 3.01 | 0.12 | 6.28 | 3.72 | 7.26 | 9.96 | 10.02 | 2.32 | 5.33 | 5.36 | 60.50 | Mrs. M. W. Broberg. |
| Pensacola . . . . . | 4.14 | 6.86 | 3.90 | 1.60 | 4.81 | 7.42 | 2.20 | 9.58 | 4.78 | 2.49 | 4.71 | 4.42 | 61.91 | Signal Service. |
| St. Augustine . . . | 0.10 | 9.20 | 1.35 | 1.15 | 4.65 | 2.10 | 3.40 | 4.10 | 4.80 | 4.00 | 7.10 | 6.30 | 48.15 | U. S. Post Hospital. |
| Tallahassee . . . . | 1.15 | 8.10 | 5.45 | 0.30 | 10.40 | 5.28 | 3.45 | 7.41 | 7.90 | 8.80 | 6.10 | 4.15 | 68.49 | Rev. W. H. Carter. |
| Titusville . . . . . | 0.74 | 7.11 | 2.16 | 2.59 | 2.92 | 6.56 | 5.62 | 4.40 | 6.35 | 3.75 | 8.68 | 9.08 | 59.96 | Signal Service. |

The tables of precipitation will indicate these annual irregularities as to amount of rainfall, though of more recent date than those from which Blodget drew his conclusions. Unfortunately, with the exception of Key West, there is no Signal Service station on the Gulf Coast south of Cedar Keys. One has been recently established at Tampa, but it has not been so far a sufficient length of time to be of any advantage. However, the following figures will show the amount of precipitation at Tampa for the four seasons and the year, giving the mean for eleven years (U. S. Army Reports): Spring, 8.56 in.; summer, 28.24 in.; autumn, 10.63 in.; winter, 8.04 in.; year, 55.47 in. Thus it will be seen that about one-half of the annual rainfall occurs in the summer.

*Annual and mean annual precipitation (in inches and hundredths) at Signal Service Stations in Florida, from commencement of observation to December,* 1886, *inclusive.*

| STATION. | Established. | 1871. | 1872. | 1873. | 1874. | 1875. | 1876. | 1877. | 1878. | 1879. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | In. | In. | In. | In. | In. | In. | In. | In. | In. |
| Cedar Keys . . | Nov. 7, 1879 | — | — | — | — | — | — | — | — | — |
| Jacksonville . | Sept. 1, 1871 | — | 57.17 | 60.65 | 43.31 | 57.60 | 55.28 | 50,58 | 60.42 | 47. |
| Key West . . . | Nov. 1, 1870 | 34.68 | 31.77 | 32.75 | 32.75 | 36.35 | 37.95 | 38.15 | 49.03 | 58. |
| Pensacola . . . | Oct. 27, 1879 | — | — | — | — | — | — | — | — | — |
| Sanford . . . . | Sept. 1, 1882 | — | — | — | — | — | — | — | — | — |

| STATION. | Established. | 1880. | 1881. | 1882. | 1883. | 1884. | 1885. | 1886. | Mean, years. | Annual mean. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | In. | In. | In. | In. | In. | In. | In. | | In. |
| Cedar Keys . . | Nov. 7, 1879 | 82.30 | 53.03 | 66.90 | 33.58 | 47.68 | 66.08 | 50.54 | 7 | 57.16 |
| Jacksonville . | Sept. 1, 1871 | 65.51 | 54.69 | 53.26 | 53.34 | 55.02 | 82.00 | 54.86 | 15 | 57.06 |
| Key West . . . | Nov. 1, 1870 | 33.41 | 53.10 | 41.86 | 48.24 | 33.05 | 34.03 | 30.13 | 16 | 39.11 |
| Pensacola . . . | Oct. 27, 1879 | 61.30 | 86.02 | 72.01 | 61.55 | 61.90 | 64.57 | 62.15 | 7 | 67.07 |
| Sanford . . . . | Sept. 1, 1882 | — | — | — | 44.61 | 46.81 | 56.58 | 64.77 | 4 | 53.19 |

(*To be continued.*)

# THE CLIMATE OF SOUTHERN CALIFORNIA FOR RESPIRATORY DISEASES.

**A Preliminary Paper.**[1]


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ALL climates with a maximum of sunshine and a dry atmosphere, if free from deleterious influences, have acquired a reputation for the cure of respiratory disorders, and this whether the climate be cold or warm. A great mass of favorable testimony has proven that there is substantial foundation for this reputation. But the good effect upon the sick of such climates cannot be wholly due to the elements named, nor to any purely climatic conditions; something must be credited to the fact of change—that patients are put under new conditions that are likely to act favorably upon them regardless of the special character of the climate. Pressure is brought to new physiological bearings able to sustain it, and relaxed from old ones, worn and fatigued; tissues and functions long forced to bear the brunt of the tension of life are relieved and allowed a long and needed rest and recuperation, while others are developed into new vigor by unwonted activity. The effects of these changes are similar in all climates not positively bad, and from any change patients may make from one place to another—a fact not to be lost sight of.

In estimating the effects of the beneficial elements peculiar to any climate of reputed value, one is confronted by the most pronounced bias for or against it, as well as the most absurd and incomprehensive inductions regarding its effects, on the part of unprofessional persons who regard themselves as competent to speak, and sometimes on the part of professional men. Hence it is difficult to reach correct conclusions.

The climate of Southern California has had recorded in its

[1] Read before the Association of American Physicians, Sept. 22, 1891.

favor some remarkable cures of pulmonary disorders; hence the most fabulous curative properties are claimed for it in all such diseases. It is also condemned as a most undesirable climate. It is said to be a balmy, dry, health-giving clime: it is declared to be a cold, damp, and cold-inducing one.

It is always difficult to determine the effect upon the sick of climate, dissociated from all other influences; it is doubly so as to Southern California, where there have sought for eternal sunshine and unvarying balminess so many, who have come with all sorts and degrees of respiratory diseases—some to recover, many to die.

Having made three visits to the region, the last extending through two-thirds of a year, and having endeavored to observe and fairly consider all attainable facts bearing on the fate there of cases of respiratory diseases, it seems to me that the following conclusions are justifiable:—

A large number of cases of respiratory diseases migrating thither become greatly improved or substantially well. A part of these are chronic cases, some having existed for years; a part are acute cases that have existed too short a time to know what their fate might have been in the climates from which they came. But many cases fail of recovery or any marked improvement; many go rapidly or slowly forward to death, as unfailingly as they could have done in the worst climate. The proportion between these two classes—those who recover, and those who fail of improvement or die—it is manifestly impossible to know. However, of the cases of undoubted grave pulmonary disease, like tuberculosis, there recover or greatly improve enough to seem to establish some valuable influence which the patients experience in this region.

Cases of long standing are less likely to improve than those of recent origin; and, if they do improve, it is more slowly, often requiring a long residence to ensure any approach to complete restoration. Amongst those that recover, although many are called cases of tuberculosis or consumption, a large majority are probably cases of non-tuberculous inflammation of the bronchial or peri-bronchial tissues, with or without throat complications. Such cases nearly always, sooner or later, improve or recover completely. But cases of true tuberculosis of the lungs do recover (and vastly more often than in our Eastern climates), and pass years without appreciable symptoms. The diagnosis of such cases is based in a few instances on a discovery of bacilli in the expectoration; unfortunately in more it must rely upon the occurrence of repeated hemorrhages and on physical signs, taken in connection with a rational symptomatology.

Of undoubted tuberculous cases the proportion recovering is small compared to the whole number seeking relief; possibly, if more accurate diagnoses of all cases seeking relief were made, the proportion would be greater, possibly it would be even less than it now appears. Some of the cases of recovery are striking in the extreme.

As elsewhere, so here, pulmonary tuberculosis in children nearly always ends fatally. With adolescents and young adults the experience is not so bad, but it is unfavorable. The prospect of improvement is greatest for (1) those in mature years of life, with good heredity, good constitution and habits; for (2) those in whom the lesion is circumscribed in the lungs, and confined to them; better if confined to one lung; and greatest of all for (3) such as fulfil the conditions named, and seek the change in the incipiency of the disease.

It is a rule that has few exceptions, that tuberculous cases come here after they have lost in delay most of the hope of improvement from any climate or conditions. Most, but not all, of this misfortune is due to faulty diagnosis at the beginning. The vast majority of such cases of tuberculosis as do come, leave their distant homes without an examination of the sputum for bacilli ever having been made; and of course those who come, or who are able to seek any climatic change, are a small proportion of the whole number of tuberculous patients. In those cases in which tubercle bacilli are found by examinations made at home, and which afterwards go to Southern California, this change is too often made after months of progress of the disease have left the patient with small hope of sustained improvement anywhere. The neglect on the part of practitioners to search early for bacilli is in part due to lack of facilities at hand or within reach for a proper examination; in part to neglect of the significance of the presence of bacilli; in part to a disbelief in their necessary connection with consumption. I cannot but regard the omission as more than deplorable—it is reprehensible in a high degree. It results in neglect or delay in the use of the best measures of relief, that costs many a poor fellow his life.

Tuberculosis may originate in Southern California, if the physiological standard be lowered by heredity, disease, overwork, bad hygiene, depressing emotions, or any other debilitating influence. Quite a number of cases do originate, curiously as it may appear, from the cold of the winters. The winters are not cold; relatively they are warm, and in the sun, out of the wind, quite warm; but they are too cold for living indoors without artificial warmth, unless one is both vigorous and in active exercise—conditions that are daily violated by large numbers of persons in their living and occupations.

While the climate has for invalids many advantages, it has some marked disadvantages. The most important one, obtaining with all dry climates, is the great variation in temperature between day and night, sunshine and shadow. The dry atmosphere permits the passage of the sun's heat easily; in the sunshine it is always warm—out of the sun there is rapid radiation of heat and coolness by comparison. The difference between the reading of the thermometer in the shade and in the sun is much greater than in the moister climates of the East.[1] Patients and people, lulled by the idea of a mild climate, forget these facts, and often poorly clothe themselves and insufficiently heat their rooms, and so take cold, often to their permanent injury. The invalids rely too implicitly on the climate, and often neglect all general hygiene, and even good regimen, and then wonder they are not well. The bad results of this neglect are more apparent in winter than in summer, but are apparent at all times. The temperature in winter, although not severe, and nearly always above the

[1] Diathermancy of the air at Sierra Madre (16 miles north of Los Angeles). Average of repeated observations. Observations made early in the afternoon.

| Elevation above sea level. | Difference between temperature in the shade and in the sun, standard thermometer, average: | Difference as shown by black bulb thermometer incased in long test-tube, corked, average: | Highest point registered by black bulb thermometer, average: |
|---|---|---|---|
| 1250 feet. | 33° F. | 74.5° F. | 162.5° F. |

freezing-point, is yet cold enough for every person indoors, occupied or not, to have his room artificially heated, unless it receive a large volume of sunshine, or unless he be freely exercising. In winter in Los Angeles it is no more true that artificial heat indoors can safely be dispensed with, than it is in Chicago or New York; indeed it is quite as unsafe, for it is the ignoring of the degrees of cold slightly below safety, so characteristic of Southern California in winter, that leads to mischief. Nobody ignores a zero temperature.

Strangers going to Southern California should in the winter wear as thick underclothing as they do in the East, and in summer much thicker, and always, if possible, of wool; and they should wear woollen night-gowns. This course is most important for invalids, and cannot ever be neglected with safety. Living-rooms in winter should be kept as warm as is comfortable; and bedrooms should be slightly warmed, at least during the process of dressing and undressing.

There is a popular fear of night air in Southern California that leads many to occupy closed and unventilated rooms at night. The theory is erroneous, and the habit most unfortunate. The night air is as good as the day air, and considerably purer, only it is colder and demands the use of more clothing.[1]

Of the climatic influences that are beneficial, dryness of air is doubtless one, a fact that has been sufficiently enlarged upon. Another influence of this sort is the great amount of sunshine, the value of which is generally believed in, but just what the measure of its value is, dissociated from everything else, has hardly beeen made clear, and would be difficult to demonstrate. There may be some unusual influence upon the system of the peculiar sunlight of this region, apart from the high diathermancy of the air, but it is unknown, and must be a subject for further study and investigation. Much of the good influence often attributed to the sunshine is, in my view, to be credited to the out-door life which it enables patients to enjoy. The equability of the climate

[1] Of plates of agar jelly exposed by me to the air for five minutes at the close of the day, and early in the morning (the close of the night), the former were found to develop nearly twice as many colonies of micro-organisms as the latter.

that enables patients to do this at all seasons is another force in the same direction, and cannot be too much emphasized. Almost in the ratio of the time spent out of doors do patients receive benefit from this climate.

So remarkable appears to be the beneficial effect of the climate of Southern California upon certain cases of pulmonary tuberculosis, that it seems probable that there is some undetermined therapeutic element of air or light. The full effect of sunlight upon physiological processes is only partly explored and the micro-organisms of the air of the region in question have not heretofore received scientific attention. Studies are now under way in this last direction, but their results, so far, are not sufficient to justify their incorporation in this paper.

Different parts of Southern California differ in their value for pulmonary diseases. The general opinion of the local profession seems to be borne out by experience that such cases do best some distance back from the sea-coast where the elevation is greater and the air dryer. Probably most points that fulfil these conditions are about equal in value. They differ, however, in their summer heat; at some of them this is, at times, extreme and depressing to the sick.

Many patients fail of the best results possible because from theoretical considerations (and sorrowfully, it must be said, sometimes by the advice of their doctors) they locate at points where the comforts of life and the proper regimen for the sick cannot be had, as well as where at times the heat is so great as to be decidedly depressing. The Colorado or Yuma desert is such a region, and some of the higher and more inaccessible points west of the mountains are nearly as bad. It is one of the first requisites for improvement in the average case that the patient be able to make himself thoroughly comfortable, be well fed with food that is proper for him, and that he be contented in his mind. In my short sojourn in the country I have seen quite a number of patients who have been practically killed by starvation, by discomfort from their environment, and by discontent—conditions that in the main were quite unnecessary.

Los Angeles, Sept., 1891.

# PRESIDENTIAL ADDRESS BEFORE THE AMERICAN CLIMATOLOGICAL ASSOCIATION.[1]

By FREDERICK I. KNIGHT,

OF BOSTON.

GENTLEMEN OF THE AMERICAN CLIMATOLOGICAL ASSOCIATION:—

It becomes my duty to welcome you to another annual meeting. We meet, alas, not with unbroken numbers, for our roll is shattered by the death of several of our most valued members.

Hosmer A. Johnson, of Chicago; Ethelbert Carroll Morgan, of Washington; Paul Kretzschmar, of Brooklyn; and Joseph Parrish, of Burlington, N. J., have passed away during the year.

Johnson and Kretzschmar were original members of the Association. The former had never taken an active part in our meetings, though last year he sent us a valuable paper. He, however, was known probably to almost every one of the Association, and all who did know him will indorse these words spoken by one of his intimate friends, "Benevolent, magnanimous, cultured, brave, strong, good."

Kretzschmar took an active part in the preliminary meeting in New York, and in nearly all of the meetings of the Association since that time, and was one of our "characters." He was noted for good fellowship and timely good sense in our discussions. It will be long before we forget the portly frame and rubicund visage of Kretzschmar.

Morgan joined the Association at the Baltimore meeting. I do not think he ever took part in any of our discussions. Mortal disease had already laid hold upon him before the meeting following his election, which was held in this city with the last Congress; but those of us who knew him remember the extraordinary will

[1] Read before the American Climatological Association at the Eighth Annual Meeting in Washington, September 22, 1891.

which bore him up in his persistency to help make our visit to his native city pleasant and successful. The same will upheld him through the tedious years which have followed, and, scholarly and skilful as he was, the tribute which springs first to the lips of every one who knew him is, "He was brave."

Dr. Parrish was elected, I believe, at the Philadelphia meeting, but has never contributed to or been present at any subsequent sessions of the Association.

It is becoming that at our present meeting with the Congress, and in the city where our first regular session was held, we should review our history a little and see how far we have justified our organization.

It needs no special pleading to show that our Association *has* justified its creation. Beginning seven years ago with a programme of six papers, the material offered us has gradually increased from year to year, till to-day a programme of thirty-eight papers is presented of a quality which will challenge comparison with any other organization.

When the Association was founded and the name Climatological adopted it was feared by some that, as the number of members who were in a position to offer anything original pertaining to climatology was so limited, the organization might have a struggling existence.

It was, however, provided from the start that diseases of the respiratory and circulatory organs should be included in the province of the Association, and soon after hydrology was added. What a vast and interesting field this gives us can be seen by a glance at our programme.

Climatology, as was natural, has engaged a good deal of our attention, and last year, for the first time, the suggestion made by me at our first meeting, that we should occasionally hold our session at some noted health-resort, was carried out. As those of you who were not present have already learned from the published report, and as those who were present need not to be reminded, the meeting was well attended, notwithstanding its distant place and the absence from the country of many of our members at the International Congress, was a success in every way, scientifically and socially, and has left a very bright mark in the memory of all who attended it. Much, in my opinion, can be done for climatology and balneology by meeting at other resorts. This would serve not only to improve our own knowledge of the places, but would also undoubtedly tend to improve the *ménage* of the places themselves. It is said that one hundred million dollars are spent every summer by Americans in Europe. Much of this is spent at watering-places. As far as natural resources are concerned, we can match every spring in Europe; but in the administration, in the use of the waters, external and internal, and in the adjuvants and accessories, we fail.

This is because we are a new country, and we have been hitherto too much engaged in gross development to give much attention to refinements; but, as time goes on, competition will undoubtedly lead to refinement of work, and we shall have as good an administration of our waters and as luxurious accessories as can be found abroad. Already changes are taking place, and at least one establishment offers as good an administration of waters and baths as any in Europe. Others are being improved. This is a great field, and one which will bring large returns to those who will engage in it.

It is not to be expected that all the people, representing the one hundred million dollars spent, will pass their summers in this country, whatever improvements may be made, for Europe has old historic attractions which we cannot rival; but there are many people who, especially after having visited Europe once or twice, would much prefer staying in this country when they can be equally well served.

This I understand to be one of the missions of the American Climatological Association, to promote the knowledge of and the proper administration and use of the climatic and balneological resources with which nature has so abundantly provided us. So far our efforts have been more especially directed to climatology, but we have had several excellent papers on the constitution and use of the waters of American Springs, and we have on our programme for this meeting the announcement of a paper by a gentleman at the head of one of the very best of our establishments. I made efforts to have other practical men to bear witness to their experience, but for various reasons they were unable to appear. I trust, however, that these gentlemen may come and present their evidence at future sessions of the Association, for they undoubtedly have a vast amount of clinical knowledge which should be imparted to the profession, but which has hitherto, from want of sufficient urging, been kept pretty closely to themselves.

The general sanitation of our health-resorts has been much improved in recent years, in many instances through the exertions of members of this Association; and in the case of most large establishments of the better class it can now be said that the drainage and water-supply are as good as the surroundings will permit.

Not enough, however, has been done to prevent the spread of disease from the sick to the well in these vast aggregations of invalids. Because we cannot do all that we would in control of the invalid's habits, is no reason that we should not do all that we can. Because we can hardly expect the majority of our patients to carry wide-mouthed bottles in their pockets in which to expectorate, as they do at some health resorts abroad, is no reason why there should be no attempt made to restrict that act. Just think in what condition the dust of the streets in some of our crowded resorts must be where the patients are mostly tubercular and expectorate without restraint!

Members of this Association are, most of them, specially interested in the treatment of tubercular patients, and realize the truth of what I say.

Just think of the condition of the patient and his friends at most of our popular resorts! I do not refer to the few sanitaria, but to the hotels where the vast majority of our patients reside at present. Very few of these hotels have been built with reference to the sick. Their rooms are occupied year after year by the tubercular, the sick and the well indifferently crowded together in the "season;" and, in one which has just been described to me by a visitor, a continuous sound of coughing of the most pitiable kind resounded through the halls from three o'clock in the morning till it was time to rise. This was in one of the most fashionable and expensive of the summer resorts. All this suggests not only hygiene of the rooms, and some regulation of the individual, but a more general plan of isolation, a cottage system, such as the sanitaria already have, for the hotels. Many patients, long since alive to the discomforts of being crowded together in these great caravansaries, now that they have learned also something of the microbic origin of disease, absolutely decline to reside in them. Several times recently I have recommended some well-known resort on account of the good living and good medical attendance to be obtained there, and my patients have chosen in preference some place in the neighborhood where they thought the climatic conditions would be the same, where the other advantages were unknown, but where they felt they would have pure air and freedom from disagreeable proximity of many invalids. It becomes us, then, and especially those resident at health-resorts, to urge upon landlords improved methods of construction, and also especially such finishing and furnishing of rooms as will permit thorough disinfection, and to insist upon this being done when a room is vacated by an invalid.

Pressure also should be made to bring these establishments, so fully occupied by invalids, more completely under medical control. This concerns the health not only of the invalids, who are certainly worse for breathing bacteria-laden air, but also is perhaps of greater concern to the accompanying relatives, who, though comparatively well, may be predisposed to disease, and who should therefore breathe the purest air possible.

The table at our leading hotels has wonderfully improved in late years, so that one is no longer surprised when a cup of good coffee or a piece of tender meat is set before him; but there is still a sigh of satisfaction when one gets good bread. I cannot refrain from reiterating what I said last year at Denver about the prime necessity of good cooking for the tuberculous patient, nor from again urging the profession to interest itself practically in the establishment of cooking-schools, not to educate our daughters in cooking-finesse, but to educate the every-day cooks, who undertake to prepare our daily food, but who generally know very little about it.

There is a strange lack of cheerfulness about many of our hotel-resorts, which we should do all in our power to modify. Music, which is provided at many of them, is usually played indoors, even when the weather is delightful. Although at times there are some drawbacks to an outdoor life in this country, such as the heat of the sun, mosquitoes, etc., much more of it could be provided than is customary. What more conducive to good cheer and good health than "afternoon tea" in the garden with the accompaniment of good music!

As mentioned before, one of the objects of the Association is the study of diseases of the respiratory and circulatory organs. We have had some excellent papers in this field which had no special reference to any climatological relations, and I would call attention to the fact that such papers are especially desired to diversify and intensify the interest in our meetings. There is no association in which such papers would obtain a more intelligent criticism.

Again we meet as a part of the Congress of American Physicians and Surgeons. It will naturally require several experiences of this kind to enable members to determine definitely as to the desirability of the connection. Our Association was decidedly in favor of the Congress at its inception, and, as far as I know the opinion of members, there has been no change of feeling in this regard. The Executive Committee of the Congress has made a decided change in its programme, as compared with that of three years ago, in that it has prolonged the time to be occupied from three to four days, and has taken every afternoon for general sessions, whereas at the last Congress the general meetings were confined to the evening. This may seem to be a good deal of time for the individual organizations to give up, but to do so once in three years will, in my opinion, surely inure to the members' benefit. We ought not to be so bound up in our own domain that we feel no interest in general medicine. On the contrary, we should welcome the opportunity to hear and take part in discussions in the general field, and thus to keep in touch with the progress of the whole science and art of medicine.

In our own domain we have everything to encourage us to activity. In climatology there is not only abundant opportunity for an increase of empirical knowledge, but also great opportunity for exact investigation of the physiological reactions of the human system to variations of atmospheric pressure, moisture, wind, sunlight, etc.

Since, in recent years, the study of physics has entered so largely into preliminary medical study, our young graduates are much better fitted than formerly for grappling with this problem. And while practical climatology will perhaps always remain, like other medical practice, to a great extent empirical, it can be brought to a thoroughly scientific basis. Therefore I do not despair of yet being able to make a differential selection of climate, even for cases of asthma, founded upon the physicial relation of the patient to the surrounding media.

A great deal remains to be done in hydrology; in the first place, in bringing the American medical profession to a belief that there is something more in a natural water than in one compounded by the druggist. In Europe it would probably be hard to find an intelligent physician who believed that a natural water and an artificial water would have precisely the same effect on the human system; in this country one might almost say that it would be difficult to find one who did not so believe.

A few practitioners here have a good knowledge of the empirical use of our natural waters, but this knowledge should be much more generally disseminated.

These two departments, of climatology and hydrology, taken in connection with diseases of the chest, offer to this Association for its cultivation an illimitable field full of variety and interest.

The Association points with pride to what she has already accomplished, and I now turn with confidence to to-day's programme for a pledge of what she will continue to do.

# THE INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

**Held in London, August 10-17, 1891.**

Specially reported by FRANCIS J. ALLAN, M.D., Department of Public Health, University of Cambridge.

(Continued from page 127.)

## Section II.—BACTERIOLOGY.

Sir Joseph Lister presided over this Section and delivered a short address, regretting the absence of Koch and Pasteur and generally reviewing the work accomplished in the last ten years.

*Malaria.*—Prof. Laveran then initiated a discussion upon the etiology of malaria by recounting the various forms assumed by the hæmatozoon described by him in 1880. These are (1) spherical bodies, (2) flagella, (3) cruciform cylindrical bodies, (4) rosette-shaped bodies, and (5) deeply pigmented or leucocytes. Similar bodies have been found in different animals, frogs, lizards, birds, and tortoises. Prof. Crookshank, Prof. Hueppe, of Prague, and others agreed with Prof. Laveran in ascribing malaria to infective conditions, probably animal parasites as described by Prof. Laveran, but it was noted that such parasites were to be found in healthy animals. Mr. W. North did not believe this, or rather thought malaria to be due to "a constant 'hammer, hammer,' on thermo-taxic nervous system of some climatic condition." Dr. Anderson, of Mauritius, described how that island was first infected with malaria, and how the infection could be traced step by step from the original spot infected.

*Cholera.*—Prof. Hueppe, of Prague, read an important paper on Asiatic cholera, and described his researches into the life history of the comma-bacillus together with the effects produced by the elaboration of the poison produced by it in the intestine. Prof. Klein disagreed with his views, and did not think the comma-bacillus always occurred in sufficient quantities to produce cholera. Dr. Cunningham found eight different species of comma-bacillus. Prof. Max Gruber, of Vienna, considered that the comma-bacillus as a cause of cholera was almost proved. Dr. Bruces, of Netley, had not found, as Prof. Hueppe had, that the comma-bacilli produced spores. He found they grew well inside of eggs and would live longer there than anywhere else.

"The Mouth as a Source of Infection" was the title of a paper read by Prof. Miller, of Berlin, in which he described the bacilli he had cultivated. A lantern demonstration of photo-micrographs was afterwards given by him and Dr. Sewell, of London.

*Streptococcus pyogenes.*—Prof. Crookshank read a paper on this micro-organism which a large number of investigators have now found in abscesses, and in connection with scarlatina and diphtheria.

*Cancer.*—A suggestive paper was read by Dr. Sheridan Delépine on "Psorospermosis and its Relation to Malignant Tumors." He showed that in the liver of rabbits tumors were produced histologically indistinguishable from papilliferous adenomata (proliferous cysts); he could not prove that prososperms were the cause of cancer, or even that they were at all times present. The paper was illustrated by an excellent series of micro-photographs taken by Mr. Andrew Pringle.

*Immunity.*—The most interesting discussion in this Section was upon this subject. Dr. Roux, of the Pasteur Institute, led off with a description of the now well-known methods of his master, and discussed the nature of the chemical products (albumoses). They were poisonous or preventive according to the dose given. Dr. Buchner, of Munich, says we are still ignorant of the essential cause of immunity, but the tendency is to the opinion that it was induced by some action of the blood apparently independent of the amœboid cells.

Dr. E. H. Hankin, of Cambridge, then read a paper on the same subject. He has shown that the bacteria-killing power of blood-serum is due not to a remnant of "vitality" according to Buchner, but to the presence of certain bacteria-killing substances to which the name of "defensive proteids" has been given. That these substances play an important part is made probable by the following considerations: (1) whilst the defensive proteid of the rat can be used to protect mice against virulent anthrax, the defensive proteid of an animal susceptible to the disease possesses a far feebler bacteria-killing power and cannot be so used; (2) by feeding *wild* rats on a diet of bread and water they can be rendered susceptible to anthrax, and at the same time their defensive proteids diminish in amount; (3) very young rats are susceptible to anthrax and contain only traces of defensive proteid.

These defensive proteids are produced by the metabolism of the animal rather than by microbes. There may, however, be other factors; and in some animals immunity may be due to other causes.

Defensive proteids may be divided into two classes by their physiological characters: "sozins" and "phylaxins." "Sozins" are defensive proteids present, naturally, in all normal animals, and appear to act on numerous kinds of microbes or their products. "Phylaxins" are present in animals that have artificially been made immune against a disease, and each phylaxin, so far as is yet known, is capable of destroying only one kind of microbe or its products. Each class may be further subdivided into those that act on the microbe itself and those that act on the poisons it generates, thus myco-sozins are defensive proteids occurring in the normal animal which have the power of acting on various species of microbe; as the myco-sozin of the rat destroying the anthrax bacillus; while the toxo-sozins destroy the microbic products, as the poison of vibrio Metschnikovi in rabbits.

Myco-phylaxins similarly denote the two sub-classes of the phylaxin group. Examples of the former may be found in that of the rabbit destroying pig-typhoid bacillus; and of the latter in that of the rabbit, etc., destroying diphtheria and tetanus poisons.

Metschnikoff's phagocyte theory is not excluded by these discoveries, as it is possible that these proteids are the weapons used by the phagocytes, and that it is only after death that they find their way into the serum.

Prof. Emmerich considered that these bactericides were intermediate products of decomposition—a stage in the passing of albumen into fat—and that they might be employed as a remedial agent in infectious maladies, if injected subcutaneously. Erysipelas and pneumonia in animals had thus been cut short.

Dr. Metschnikoff replied to the criticisms on his theory, and referred to the complete destruction of bacilli by amœboid cells. Some very fine slides exhibiting the process were shown. Dr. Armand Ruffer said that evidence was to be had that the leucocytes absorb bacilli while the latter are still alive. Dr. Roux also supported the direct action of the cells on the bacilli.

*Tuberculosis.*—A combined meeting of Sections II. and III. was held to discuss this important subject.

Prof. Burdon-Sanderson spoke chiefly on the etiology of tuberculosis. Arloing showed that 1 out of every 6 carcasses of beef was tuberculous. If danger from this source existed, it could not be exaggerated, as 14 per cent. of the deaths are from this cause (principally before the age of 4 and between 20 and 30 years). In whatever part of the body the tuberculous matter is inoculated the lungs are generally the first part infected except in children, in whom it is possible that there are infected glands at birth, and that the advent of measles or whooping-cough may lead to the accompanying broncho-pneumonia becoming tuberculous also. More experimental research is still necessary.

Prof. Bang, of Copenhagen, followed with a paper dealing with the milk and meat of tuberculous animals. The muscular tissue is so unfavorable a nidus for the tubercle bacilli that they do not multiply in it, and must always be very limited in number. If tuberculosis be strictly localized, the meat is not a source of danger; if general, it may be. Milk should be heated sufficiently to kill tubercle bacilli before manufacturing it into cream or butter.

Prof. Arloing considered the danger of drinking milk from tuberculous cows to be very great, and thought all tuberculous animals dangerous to health.

Prof. MacFadyeau and Dr. Sims Woodhead read a conjoined paper on the same subject, and agreed generally with Prof. Bang, but thought precautions ought to be taken, especially in regard to milk and the persons employed in dairies. Frequent inspection of animals was necessary.

Prof. Lister said spontaneous tubercle was never found in sheep, and it was therefore pleasing to know we might eat mutton in safety. Eventually it was agreed that "the etiology of tubercular disease of early infancy (between 3 months and 5 years) be referred for discussion to the next Congress."

Drs. Metschnikoff and Roux then read a paper, illustrated by some beautiful drawings, showing how concentric circles of hardened inflammatory tissue formed around tubercle bacilli, destroying them, or eventually becoming calcareous.

In connection with this Section a very valuable museum had been arranged, and was constantly frequented by members desirous of seeing the apparatus employed by different investigators and of gazing at the beautiful specimens exhibited under the microscopes.

## Section III.—The Relations of the Diseases of Animals to those of Man.

The President of this Section was Sir Nigel Kingscote, K. C. B., and the meeting at once addressed itself to the subject of rabies, introduced by Dr. George Fleming, who repeated his well-known views on the question.

The dog is the propagator of this malady, and it should be recognized that it is quite possible to stamp out this disease by the wearing of muzzles by dogs during the prevalence of the disease and for a period equal to the longest period of latency after the malady has been suppressed. Limited international action might entirely remove the disease.

Prof. Ostertag, of Berlin, Prof. Brown, of London, and others agreed on the necessity of united action.

*Meat Infections—Food Poisoning.*—Extremely interesting papers on this subject were read by Drs. Ballard and Vaughan.

The details of a number of cases were narrated by the first speaker, who suggested that the reason why pig-meat furnished the largest number of instances of food-poisoning is that it is most freely productive of gelatine when cooked, and that this is a favorite nutrient for morbific bacilli. He recommended thorough cooking, scrupulous cleanliness, and ventilation of places where cooked food is stored, or where pork or other fresh meat is salted, dried, or otherwise prepared, with precautions against the entrance into these places of ground-air and of morbific or unwholesome emanations.

Dr. Victor C. Vaughan, of Ann Arbor, Michigan, followed, dealing with the question under the following heads:—

(1) Infection may be due to a diseased condition of the animal.

(2) To the inoculation of food with specific pathogenic micro-organisms outside the body of the animal from which they were derived.

(3) Meat and milk, especially the latter, are often affected with saprophytic, toxicogenic bacteria.

The infection of milk Dr. Vaughan looked upon as a most serious question. Diarrhœa in children is not due to one specific germ, but may be caused by different kinds elaborating chemical poisons.

Prof. R. Blanchard, of Paris, recognized two distinct categories of poisoning by animal flesh:—

(1) Botulisme (from botulus, a sausage), produced by microbes which have produced ptomaines.

(2) Poisoning from fresh meat caused by leucomaines produced by physiological activity.

Prof. E. Klein read a paper on "Infectious Udder Diseases of the Cow" in relation to epidemic diseases of the human subject, with special reference to the "Hendon" disease and scarlet fever. A considerable amount of heated discussion took place, somewhat against Dr. Klein's views, and it was evidently the opinion of the meeting that there was room for much more investigation before definite statements could be made.

Prof. Crookshank gave an interesting review of our knowledge of actinomycosis and its prevalence throughout the world.

### Section IV.—Infancy, Childhood, and School-Life.

In this section Dr. Francis Warner read a paper on "The Scientific Observation and Study of Children in Schools, and the Classes into which they may be Grouped." His remarks were based on the observation of 50,000 children seen in schools. He had employed schedules to facilitate records by the teachers, and he classified the children as follows:—

(1) Children well made, with nervous system acting well, and mentally bright normal children (40,851).

(2) Children well made, nervous system acting well, but dull at school.

(3) Children presenting various defects in development.

(4) Those with abnormal nerve signs, divided into two groups: (*a*) Associated with low development. (*b*) Associated with delicacy and nervousness. (See also "Demography" for further particulars.)

(5) Children presenting both defects in development and abnormal nerve signs. Such children are usually dull at work and of low nutrition.

(6) Eye cases.

(7) Deaf or partially deaf.

(8) Children crippled, deformed or maimed.

(9) Epileptic cases.

(10) Cases exceptional in mental status.

(11) Children delicate and thin.

The greatest number of defects were found in boys. The result of his examinations showed the need of special methods of teaching and of separate schools and classes for those unable to be taught with ordinary children. Many of these cases, from improper means of education, finally drifted into the criminal class of the country.

Dr. Jacobi, of New York, supported this on the ground that the strong and intellectual should be protected from the weak and unintellectual, as association with them tended to cover the standard of education.

Dr. Langdon Down was glad to have confirmed the conclusions he had come to many years ago from a similar investigation. He had been impressed with the fact that many of the inmates of prisons were really feeble-minded people. Mr. Noble Smith believed that if we improved the homes of the children with better nutrition we should hear less of mental over-pressure, and that afterwards we would have healthier, more robust, and less discontented people.

Dr. Octavius Sturges wished to direct attention to nervous disorders produced in children, and especially in girls, by the circumstances of school-life, such as overwork, punishment, the excitement of examinations, harsh treatment, etc.

*Vertical Writing.*—Mr. J. Jackson and Dr. L. Kotelmann, of Hamburg, read papers on this subject, claiming for upright writing its superiority over oblique for naturalness, simplicity, and legibility, its freedom from all abnormal or constrained postures of the wrist, shoulder, spine, body or eyes, for speed and for ease in teaching and acquiring. A resolution was passed by the Section urging its adoption of it in elementary schools.

*Employment of Children in the United States.*—Dr. Jacobi gave a *résumé* of the laws existing in the States for regulating the employment of children, and claimed that American legislation was in advance of British in extending the age at which children were allowed to work in factories. A resolution was agreed to claiming that private schools should be under an efficient system of sanitary inspection.

*The Working Curve of an Hour.*—By a series of interesting experiments with classes of children in arithmetic Dr. Leo Burgenstein demonstrated that children from eleven to thirteen years of age become gradually less capable of work during the first three-quarters of an hour; mistakes become more frequent and less work is done during the third quarter than in the former; and, curiously, in the fourth quarter the power to work appears to return. The conclusion drawn was that continuous work at one subject should not last more than three-quarters of an hour, but it would rather seem that the half hour would be the better place to change.

*Physical Education.*—Mr. George White, chairman of the committee on this subject of the school board for London, then took possession of the platform with a band of children to illustrate his remarks and show the exercises given to develop each part of the body uniformly and harmoniously with due regard to physical idiosyncrasies or any abnormal or accidental characteristics present.

The time for these exercises should not be too near meal-hours, and they ought to be given, if possible, in pure open air or in a large well-ventilated hall or shed.

The advantages claimed are that great help to school discipline is given and the effect of hereditary disease or weakness—especially chest mischief—is minimized. For young children musical accompaniment is desirable; girls ought to wear such clothing as will allow free unconstrained movement of the muscles and limbs. The main object with girls is to secure regular development and harmony of form, while with boys this is a secondary object to the promotion and general diffusion of muscular strength; military drill ought undoubtedly to supplement the ordinary physical exercises for boys. Teachers must themselves be properly trained. The use of mechanical apparatus, useful enough for the adolescent and adult, is to be deprecated for children.

Physical exercises should supplement games, but swimming and many games may be utilized. The Earl of Meath said that in Germany and Sweden children used apparatus in their exercises.

Prof. F. C. Robinson, of Bowdoin College, Brunswick, Maine, said he hoped to take back with him a special report on this subject. He stated that the Board of Health in Massachusetts could compel a city to put its schools in good order at its own expense. They were satisfied with the results of the Swedish system, which was compulsory in several places.

Resolutions were then carried that the hours of home work be restricted (a large proportion of the members would abolish all out of school work); that ample physical recreation be carried out; and that in the interval between the exercises the body should be properly rested; that girls and women should be instructed in personal and domestic hygiene as an integral part of their education.

*Neglected Children.*—Mr. William Mitchell, Vice-chairman of the Glasgow School Board, read a paper on this subject. He thought the State should interfere to prevent the herding together in one room of boys and girls over twelve years of age with their parents. Cities should have stringent powers to deal with insanitary dwellings.

Miss Davenport Hill thought societies for providing free dinners, medical attendance, and such like, might increase the evils which they desired to avoid, by taking away responsibility from the parent. Every effort should be put forward to make the parents do their duty. This was received with much applause.

Dr. Victor Desguin would like to see orphan homes abolished and boarding out or life in agricultural colonies substituted.

*Free Dinners for School Children.*—The Rev. J. Llewelyn Davies introduced this important question. He looked upon poverty as often due to the recklessness of parents. How are the children to be selected for free meals, and if a dinner is given why stop there? Parents who spend their money in drink and half feed their children should be punished; where extreme poverty is the cause it is more effectual and more considerate to give money privately to the parents than to publicly administer charity.

Mrs. Besant said education was a right to which every child had a claim. It was given to the children for the sake of the State, but they could not teach a half-starved child. What is called over-pressure in schools is generally under-feeding. They had no right to punish a child because its parents were evil. She proposed, and it was seconded by Lord Meath, "That this Congress, asserting the duty of the State towards its future citizens in the matter of education, declares that the feeding or clothing of destitute or neglected children is necessary for their efficient education, and where such destitution or neglect is due to the misconduct of the parent or guardian of the child, it is the duty of the Legislature to visit that misconduct with penal consequences." This was carried in a large meeting.

Interesting papers dealing more particularly with the care and treatment of epileptic, mentally feeble, and imbecile children were given by Drs. Fletcher, Beach, Shuttleworth, and Langdon Down. Dr. Beach complained of the deficiency of accommodation for imbeciles. There are at present 8000 improvable imbeciles in workhouses or asylums in England who ought to be in proper training institutions.

It was agreed that the Congress be called upon to appoint a commission consisting of persons severally conversant in (1) examination of the physical condition of children; (2) mental condition and diseases; (3) education and methods of dealing with children; (4) statistical compilation of facts; whose duty it should be to inquire into the condition of children in schools and elsewhere upon a fixed plan.

Dr. Strümpell, of Leipzic, submitted such a plan.

*Blind and Deaf Children.*—Dr. Campbell, principal of the Royal College for the Blind, Norwood, read an interesting paper on the present state of the education provided for the blind, and held that it should be removed from a charitable to a national basis.

Dr. Gutzmann, of Berlin; Mr. VanPraagh, of London; Dr. Browner, of Bradford; Dr. Kotelmann, Major-General Moberley, Dr. Edward Gallaudet, of Washington, took part in the discussion, and agreed with Dr. Campbell especially in recommending the adoption of the oral method.

Dr. Campbell received a large party at his institution, and showed them his methods of teaching and the excellent results.

Section V.—Chemistry and Physics in Relation to Hygiene.

The president, Sir Henry Roscoe, M. P., introduced in his inaugural address the question of air pollution.

Dr. W. J. Russell, of Glasgow; Mr. Ernest Hart, Mr. Pridgin Teale, Mr. A. Fletcher, and others, joined in the discussion, but nothing new was brought forward, either in the way of facts or suggestions, if we except an ingenious apparatus exhibited by Dr. Delépine to prevent the discharge of carbon from chimneys.

*The Treatment of Sewage.*—Dr. J. C. Thresh opened on this important matter. He narrated the different methods in vogue for the removal of impurities from sewage, viz.: 1. Subsidence; 2. Filtration; 3. Percolation through materials exerting some chemical or catalytic action on the organic matter; 4. Precipitation by addition of chemicals with the formation of insoluble compounds; 5. Precipitation by electrolytic treatment (Webster's process); 6. Destruction of organic matter by oxidant (as acid and permanganates on London sewage); 7. Sterilization; 8. Nitrification; 9. Utilization as food for growing crops; 10. Broad irrigation. The choice of methods and their combination varies according to the character of the sewage, the position of the town (whether by sea, tidal river, or stream which has to furnish another town with water), and the mode in which the effluent is to be finally disposed of.

Sir Henry Roscoe remarked that the question appeared to be, do any of the processes mentioned, or any combination of them, enable us to get rid of our sewage without causing a nuisance? He referred to the valuable experiments of the State Board of Health for Massachusetts, and considered that the problem would not be solved until it was put upon a scientific basis.

Dr. Alfred Carpenter looked upon it as a duty that each locality owed to the nation, to utilize the nitrogenous matter in its sewage. He quoted from his thirty-one years' experience of the Croydon sewage farm.

M. Raechling, C. E., said that in Leicester every chemical process had failed. He compared the sewerage systems of Berlin and London. In the former place the city was divided into twelve drainage districts, each independent of one another; the sewage was conducted to its sewage farms. The death rate from zymotic disease was, as at Croydon, *nil.*

Mr. G. H. Bremner was in favor of an aeration process, and Mr. A. Seller of the A. B. C. process. Subsequently a resolution was carried "That in the opinion of this meeting the best known method of disposing of the sewage of towns is that of purification and utilization on the land."

*Meteorology and Hygiene.*—In a discussion on the relation between these two branches of science, Dr. Russell, of Glasgow, stated that in regard to London fogs there was a great increase of death-rate; a low temperature accompanied the fog; but there were, on the other hand, several cases of dense fogs without decrease of temperature, and then the death-rate did not rise above the average. Dr. Longstaff said weather and death curves could not definitely correspond, owing to the interval between a death and its registration, usually five days; then some of the deaths might not occur for some considerable period after the occurrence of the fog. Dr. Tripe said he usually allowed two weeks in his investigations on the subject; but he thought that to be too small an interval, except as regards diarrhœa and diphtheria.

Mr. Buchan said that in the beginning of 1890 the deaths registered as due to influenza accounted for only about a seventh part of the large increase of mortality accompanying the epidemic. Diseases of the respiratory system added most largely to the number, and diseases of the circulatory system and enteritis occupied second places.

*Improvements in Bread-making.*—Mr. John Goodfellow divided his subject into two divisions:—

(1) Improvements in whole-meal bread.

(2) Improvements in other kinds of bread.

In the first class, improvements had been in the direction of obtaining a very fine and very dry meal; he showed a specimen of tritecumina bread and of cyclone bread, in which the bran particles are so fine as to obviate irritating effects. In the former the bran is cut up in machines; in the latter the grains are pulverized in sealed chambers by air-currents produced by fans.

In regard to non-whole-meal breads—white and brown—he said that white was deficient in proteid material, in fat, and in mineral matters, especially phosphates, sulphur, and chlorine. The standard ratio of proteid material to carbo-hydrates may be taken as 1 : 3.2; in ordinary fine white bread it is as 1 : 7. He exhibited Black's patent fermented bread, which contains added gluten; ratio 1 : 3.6. Diastase bread containing added diastase producing 80 per cent. more sugar and dextrine than ordinary bread; nitrogenous ratio 1 : 6.5.

Brown breads. Frame food bread, made from white flour, to which an extract of bran is added giving the value of whole meal without the irritating and indigestible siliceous particles, thus has 50 per cent. more mineral matter than fine white bread; nitrogenous ratio 1 : 3.9.

Germ bread; ratio 1 : 3.

Health bread; ratio 1 : 3.6; the outer layers of the bread are rejected.

Sir Chas. A. Cameron, of Dublin, thought that good white bread was preferable, and more digestible than the coarse brown breads in the market.

### Section VI.—Architecture in Relation to Hygiene.

Sir Arthur W. Blomfield gave an address dealing with the desirability of combining hygiene with art.

*Open Spaces.*—The Earl of Meath (better known by his old title of Lord Brabazon) said that the governing bodies of cities and towns should lay down for themselves some such rule as that public recreation grounds should be provided in each parish in proportion to the number of its inhabitants.

Much benefit would accrue from a cessation of building immediately adjoining all the larger towns, and if a town that had reached a certain size were allowed to grow no more except from centres at a given distance outside, the suburbs would only be allowed to spread at the end furthest from the town. There would thus be a preservation of open ground round the towns.

In towns themselves every effort should be made to have beautiful streets, with trees and seats and beds of flowers; creepers should be planted on bare walls; every disused graveyard and deserted inclosure should become a bright garden; and plots of unused land should be secured for playgrounds or outdoor cafés. If the preservation of open spaces were properly taken in hand, there would not be so much need as there now is for increasing the facilities for taking people from the towns to the country or seaside. He thought the open spaces should be connected with park-like thoroughfares or boulevards, as in Chicago.

*The Sanitation of Theatres.*—Messrs. Lemon Browne and Ernest Turner read papers on this subject, copiously illustrated by diagrams taken from conditions existing in London theatres. The condition of affairs behind the curtain was described as something which must be seen to be credited. Rooms with water-closets in them, with no ventilation, no windows, no fireplaces, and lighted day and night by gas; urinals ventilated to the stage, unventilated water-closets in close proximity to refreshment or cloak-rooms. Dr. Dolan, of Halifax, affirmed that he had traced many cases of infectious malady to the insanitary condition of theatres; and your reporter added that good work might be done among concert-rooms and private clubs in respect to their sanitary arrangements; it seemed to him impossible for architects to provide what was right in the limited space generally at their command; he therefore thought it should be a *sine qua non* that all theatres should have a clear space around them.

*Block Dwellings.*—Dr. Sykes, of London, read a paper giving his experiences on this style of dwelling-house. He advocated the building of cottage dwellings for artisans in the suburbs or country. In towns, if insanitary buildings are removed and the site has to be utilized for rehousing, block dwellings must be employed in order to house the same number of people on the same area, under improved conditions.

Dr. Newsholme, of Brighton, pointed out that notwithstanding the more unfavorable age-distribution of population in the Peabody buildings, the death-rate was 2 per 1000 lower than in London as a whole; the birth-rate was higher, but the infantile mortality was much lower than the average. The death-rate, however, of children between one and five years of age was higher on account of scarlet fever, diphtheria, measles, and whooping-cough, diseases which are communicated by direct infection; but enteric fever death-rate was only half that of London.

*The Heating of Towns by Steam from Central Stations* was the title of a paper by Mr. S. M. Burroughs. He claimed for the scheme the advantage of abolition of the smoke nuisance, an economy of heat, avoidance of dust and dirt in rooms and of risk from fire, economy of labor, and a more easily regulated temperature. Mr. Blashill, architect of the London County Council, agreed that the scheme was one well worthy of trial.

## Section VII.—Engineering in Relation to Hygiene.

The business of this Section was opened by an address by Sir John Coode, in which he gave some statistics showing the magnitude of London. Thus he mentioned that the streets and roads, if placed in line, would reach across to the Gulf of St. Lawrence; the average quantity of water per head per day was 24.75 gallons for domestic purposes only; in the latter half of the seventeenth century the average mortality was not less than 80 per 1000; at the end of last century, 50 per 1000; during the decade ending 1850 it was 25; at 1870, 24; and in the decade ending 1890 it had dropped to 19 8 per 1000; while for the year 1889 it was as low as 17.4.

*Sewage Disposal.*—In discussing the question of sewage disposal strong feeling was manifested against the admission of sewage to rivers. Professor Pacchiotti gave an account of the rapid strides which Italy is making in sanitary reform; and Mr. James Lemon, M. I. C. E., compared the systems of England and France. Messrs. Santo Crimp and R. Read said that for ventilating drains and sewers six-inch shafts were of more value than furnaces or fans. Inlets should be small, fixed at the street level, and not more than 100 yards apart; outlets should be numerous, fixed above the roofs; the sum of their sectional areas in the distance between a pair of inlets must exceed the sectional area of the sewer.

*Double Distribution of Water.*—M. Bechman, chief engineer of bridges and roads in France, examined the question of having two waters of different qualities distributed by distinct systems of pipes as has obtained in Paris since 1854, and concluded that if two kinds of water were employed, only potable water should be taken into houses. Mr. Wm. Matthews then described the condition of things at Southampton, where the surface drainage from the common and adjacent lands is used for watering the roads and other sanitary purposes, at a considerable saving, as the potable water has to be both pumped and softened before use. In other places sea-water has been utilized as a secondary supply. Dr. Frankland thought a dual supply was not required in England. Herr W. Kümmell said that in Germany they delivered one quality of water when possible, but if this is not possible the best water only is laid on to the houses.

*Purification of Water.*—Mr. Wm. Anderson described his process of purifying water by means of scrap iron in revolving cylinders. The water takes up one-tenth to one-fifth grain of iron to the gallon, but deposits it afterwards on aeration, or by flowing along a shallow trough into a settling reservoir. The peroxide of iron carries down the organic matter and other impurities, and after filtration through a shallow layer of sand is practically free of microbes. Experiments of an exhaustive character, at Boulogne-sur-Seine, show organic matter reduced 63 per cent., and the microbes sank from 4086 to 40 per cubic centimetre.

Dr. P. S. Wales, U. S. Navy, was of opinion that mechanical filtration had numerous advantages over the filter-bed system.

Prof. Arthur Oelwein, of Vienna, said an important point in the supply of water was its refrigeration. Prof. Simony had made evident the peculiar fact that in mountain lakes with slight supply and discharge the temperature of the water in midsummer rapidly falls from 20° C. at the surface to from 5° to 4° C. at the depth of twenty inches; whereas in lakes with a rapid supply and discharge the fall of temperature is very gradual. Prof. Oelwein, therefore, utilized this fact in planning a water supply by causing a deep pit containing about 9000 cubic metres, to be dug in one of the reservoirs, from the depths of which the water was forced up through the overlying column of water, reducing the temperature of the water in the reservoir from 23° C. to 15° C.

*Self-Purification of Rivers.*—Dr. Percy F. Frankland referred to the many important experiments which have been made in England, all of which negative the theory of self-purification as regards dissolved organic matter, although removing suspended matter. He then reviewed the works of foreign authors in this field, some of whom think that dissolved matter is removed. He contended that there is no evidence of sufficient purification to justify the use for town supply of river water which has received sewage contamination. Of far more importance in securing the greater safety of water supplies from rivers and surface sources generally is their efficient filtration through sand.

Mr. Baldwin Latham, Mr. A. Mault, Dr. S. Smith, Mr. Anderson, and others, disagreed, thinking Dr. Franklnad was hardly justified by his experiments in coming to these conclusions. They believed that plants and animals exercised a very important purifying action.

M. Maignen spoke on the importance of filtration and boiling of water. He thought the spores in the water were incubated by the heat and not killed.

M. Margon said that if water was kept at 130° C. for ten minutes it was perfectly sterile, but it was not so if kept at that temperature for five minutes only.

*Drainage and Irrigation of Land in their Relations to Health.*—Mr. R. F. Grantham, C. E., considered that nearly all lands could be made salubrious by drainage. Too little attention had been given to the subject in country districts. The investigations of the State Board of Massachusetts are quoted to show the prevalence of intermittent fever in the vicinity of pools, lakes, reservoirs, streams, marshes, drowned lands, upturned soil, and localities more or less infiltrated with sewage. Irrigation, if proper drainage be not provided, is fruitful in its effects on the health of the people. Malaria is more prevalent when water has only partly evaporated, or been partly drained off, than when the land is completely covered with water.

Mr. Baldwin Latham, Dr. Thornton, and others agreed with the author that subsoil drainage ought to go hand in hand with irrigation.

*Refuse Destructors.*—A number of gentlemen read papers on the methods of disposal of town and house refuse. Mr. C. Jones, C. E., of Ealing, described the "destructor" he employed combined with an arrangement for destroying also the fumes given off, and for preventing the escape of dust and charred paper. The gases are subjected to a temperature of from 1100° to 1500° F., and the heat thus generated is utilized in a variety of ways, as for driving dynamos, etc. There are complaints by residents.

Dr. J. F. Meyer, of Copenhagen, said that English house refuse contained much more unburnt coal than in most cities on the continent of Europe; hence they found they could not burn satisfactorily unprepared house refuse unless fuel were added to it, which was expensive. It was found that the difficulty could be met by removing the large proportion of earth, sand, and fine ashes with riddles.

Mr. George Laws, City Surveyor of Newcastle-on-Tyne, thought refuse destructors a clumsy expedient, but fairly effective, and often the only alternative. The residue he found was about thirty per cent., and if properly burned is a hard and useful clinker, and is composed of sound dry ashes which may be used for various municipal purposes, and even made into paving slabs.

Section VIII.—Naval and Military Hygiene—Quarantine.

Here, as in another Section, the subject of quarantine formed the pivot of an interesting debate.

Dr. Collingridge read a paper by Dr. Frederick Montizambert, of Canada, describing at length the modern methods adopted in the United States and Canada for preventing the invasion of infectious diseases.

Dr. Bérenger Feraud, Director of the French Naval Medical Service, said that in France, when an infected ship arrived at a port, it was put under conditions to prevent danger to the public health, the time of detention being always limited to the minimum which prudence would allow. Dr. Armstrong, of Newcastle, believed there was room for improvement in our own arrangements, especially at Liverpool, where no less than three authorities interfered in the work which ought properly to be relegated to the port sanitary authority.

Dr. J. Wright Mason, of Hull, spoke in reference to the inspection of emigrants arriving at that port. They numbered from 40,000 to 50,000 annually, and were proceeding to America *via* Liverpool. They were inspected both on arrival and departure.

Col. Alfred H. Woodhull said that United States Consuls at maritime places telegraph to Washington the name of the ship and the character of disease believed to be carried, and this information was immediately conveyed to the Health Officer of the port of destination.

*Sanitation Afloat.*—Fleet Surgeon R. W. Coppinger said that the proper air-space accommodation was not possible on board men-of-war, and that the question of ventilation has always been one of difficulty. The only satisfactory method on board ship was by artificial means, and of these he thought the "supply method" was the best adopted. Open bogey fires would be much better replaced by a system of steam pipes. The use of compressed air has been suggested as a means of cooling the air between decks in tropical regions.

Dr. Paul Hyade, of the French Navy, said that steam-heating was being adopted in their ships.

Dr. Collingridge thought open bogey fires were not only wasteful, but dangerous. He recommended the use of a circular wrought-iron stove lined entirely or covered with fire-clay. He thought the cubic space allowed very small, and was not surprised to hear that phthisis was prevalent among sailors.

Dr. Armstrong said that crews were sometimes exposed to the exhalations from the cargo by reason of defective bulkheads, etc.

*Dietary Scales.*—Dr. W. Spooner drew attention to the monotonous and ill-suited diet supplied to sailors. He had suggested to the Board of Trade, and it had recommended it, that in addition to the lime-juice and sugar required by law, biscuit, 5 pound 4 ozs.; flour, 2 pounds 8 ozs.; beef, 2 pounds; pork, ½ pound; preserved meat, 2¼ pounds; peas, 1 pint; preserved potatoes, 8 ounces; preserved carrots, 1½ pounds; butter, 6 ozs.; oatmeal, 8 ozs.; rice, 8 ozs.; marmalade, 1 pound; sugar, 14 ozs.; raisins, 8 ozs.; molasses, ½ pint; suet, 4 ozs; pickles, 4 ozs.; tea, 1 oz.; coffee, 7 ozs. be given weekly. Substitutes: Fresh meat to be given instead of salt and preserved as long as possible after leaving port; fresh potatoes or carrots, 3½ pounds per week, instead of preserved, as long as they last; oatmeal may be substituted for rice in cold weather, and *vice versa* in hot weather; preserved onions may be used instead of the carrots. Many firms have adopted this scale with improved health among the sailors. A minimum diet scale should be made compulsory, and the food supplied should be inspected.

Mr. C. J. Swanston, of the Board of Trade, said that diet was not the only element involved in the question of the health of crews. Many of the victims of scurvy were men whose health had been debilitated by previous debauchery on shore.

Brigade-Surgeon Burton-Brown looked upon efficient ventilation as of much importance in the prevention of scurvy.

Miss Helen Taylor suggested the necessity for having a medical coroner at every port, whose duty it should be to inquire into the cause of death of every seaman who has died in the course of the voyage on board each ship coming into port.

*Enteric Fever in the Army.*—Prof. Lane Potter, of Netley, dealt with the question chiefly in relation to India. He showed that the increase in enteric and the decrease in intermittent, remittent and simple continued fevers were simply a matter of nomenclature and more exact diagnosis.

Surgeon A. M. Davies said that this disease had always been prevalent with armies in the field in all parts of the world.

Dr. Schneider reported that the diminution of this disease in the French army was continuous and progressive. The measures adopted were improved drinking water and improved latrines. Where water was not pure Chamberland's filter was employed.

Brigade-Surgeon Harvey was impressed with the idea that there was another variety of fever intermediate between enteric and remittent, yet differing from the one in important particulars, especially the range of temperature and pathological appearances, and from the other in not being influenced by quinine. He thought the term "typho-malarial" might be used provisionally to describe such cases.

Dr. Godfrey, U. S. Marine Hospital Service, said in one series of typho-malarial cases all the patients were invaded by both the bacillus of Eberth and the hæmatozoon of Laverau. The patients were all from one place and had drank the same water.

## Section IX.—State Hygiene.

Lord Basing, who, as Mr. Sclater Kooth, was at the head of the Local Government Board when the 1875 Public Health Act passed into law, presided over this Section, and gave a *résumé* of the condition of legislation from early times down to the present day.

*State Control in Reference to the Homes of the Working Classes.*—Dr. Elgin Gould, of Washington, dwelt on the rapid growth of American cities, and urged the advantages of systematic inspection and supervision in the first instance, and demolition when the conditions become insufferable. He believed in the systematic inspection of all houses let in tenements to more than one or two families. Registration of the condition of all houses was preferable to leaving the discovery of defects to the chance of illness or death.

Mr. John Hamer said that the want of control was leading to the erection in our suburbs of jerry-built houses, which would be a source of danger in the future.

Dr. Theodore Thompson, of the Local Government Board, divided the poor into two classes—those who, with a struggle, maintained a decent existence, and the loafers, drunkards, and criminal classes. The former labored under excessive rents.

Mr. S. M. Burroughs thought the chief difficulties in the way of housing the poorer classes were the necessity for living near their work; the dearness of land, arising partly from the same cause; the rates and taxes upon houses; and the average inability to pay for good houses among the working classes.

He advocated the acquisition of railroads by the State, and free travel, and the taxing of the land values which would thereby be increased instead of the houses. The transfer of taxation from industry to unearned increment would be of the greatest benefit to the working classes.

Mr. Henry Rutherford, barrister-at-law, followed, urging the expediency of the sanitary registration of public and semi-public buildings by the certificates of competent persons.

Dr. Pankhurst, of Manchester, said there was no den so noisome for which rent could not always be obtained.

Dr. Louis C. Parker maintained that all tenement houses, schools, and similar establishments should be inspected several times a year.

*Sale of Poisons.*—Dr. Danford Thomas, Coroner for West London, desired to draw attention to the facility with which poisons could be obtained by the public from chemists, grocers, drapers, oilmen, and wholesale houses. The Japanese had laboratories for the analysis of patent and secret medicines, and adequate legislation. He moved, seconded by Dr. Littlejohn, of Edinburgh, that it is essential in the public interests that greater restrictions be placed upon the sale of poisons, and this especially in Great Britain and her colonies.

*Disposal of the Dead.*—This proved a subject for much debate, and ended in a decided victory for the advocates of cremation. The battle was opened by Sir Henry Thompson, who said he thought no one could object to the advisability of cremation of bodies of those who died from infectious diseases. Destruction by fire was the only perfect and absolute means of disinfection, of avoiding contamination of the water supplies, and of preserving the best areas for habitation, or for the production of food. He thought there was really less danger to the living by using sealed lead-coffins than the easily-perishable envelope which some proposed, and which was good enough if the interment ground was far away from the haunts of men and in favorable soil. Since 1885 two hundred corpses have been cremated at Woking, and all that is wanted is a more stringent investigation into the cause of death by experts, as had been adopted in other countries.

Mr. Seymour Haden at once followed on the other side. He formulated a number of propositions, the first of which was, that the natural destination of all organized bodies that have lived and that die on the earth's surface is the earth, and the last, "That the remedy for the evils of our present-day mode of burial is not in cremation, but in a recognition and submission to a well-defined law of nature." He denounced cremation as "a direct and potent incentive to crime," and appealed to the government to pronounce it illegal, unnatural, uncalled for, and dangerous.

Sir Spencer Wells told a story of Sir James Simpson, who was consulted by a lady, to whom he suggested chloroform during her confinement. On her protesting that it was unnatural, he asked her how she had come from Belfast; she replied, by steamer; whereupon Sir James remarked that that was a most unnatural method—the natural way was to swim.

Dr. Salomon and M. Caffart, of Paris, described the procedure and precautions adopted in France, in connection with inhumation and cremation, and moved that all legal obstacles to cremation be removed, and that it be always practised on the battlefield. Carried almost *nem. con.*

The Rev. F. Lawrence observed that the practice of boxing up human putridity dated only from the 16th century. His association (Church of England Burial Reform) advocated cremation, or earth to earth burial.

Dr. Eben. Duncan, of Glasgow, described the horrors of pit-burial during the cholera epidemics, and mentioned that gangrene had been persistent in a Glasgow hospital until a small cemetery close by had been done away with and the bodies removed. Many of these were but little decomposed, although buried without coffins.

Dr. Willoughby said that the Italian Legislature had so completely met the medico-legal objections that cremation had been the means of detecting poisoning which would otherwise have been undetected.

Dr. Franklin Parsons said that the evils of burial were due in great measure to delayed burial, and to the choice of unsuitable soils and sites for cemeteries. Suitable soils were very scarce.

Mr. Seymour Haden, in his reply, said the danger to the water supply was not so grave as had been made out, and mentioned a pump quite near a graveyard, yet one of the most wholesome in London.

Mr. Ernest Hart here intervened to remark that at his instigation this well had been closed on account of its polluted condition, and the water so praised by Mr. Haden had had company's water laid on to it for a number of years. A resolution in favor of cremation as a rational proceeding, especially called for in cases of contagious diseases, was carried with only four dissentients in the crowded room.

*Notification of Infectious Diseases.*—An equally large audience gathered to discuss this matter, which was introduced by Mr. D. Biddle, from parts of whose paper the audience expressed very strong dissent. He considered that statistics proved notification to be of little service in assisting to prevent infectious disease.

Dr. Boobbyer, of Nottingham, said that critics had fallen into serious errors in their attempts to manipulate statistics. Scarlatina had considerably diminished in the nine years in which notification had been in force. The results of prompt notification had been well illustrated by the immediate suppression of small-pox at Leicester, and the consequences of its absence in the epidemic at Sheffield.

Dr. Hewitt, of Minnesota, said that they had a similar law. It had been in force eight years, and he knew that by its means they had been able to reduce the diphtheria death-rate very considerably.

Dr. Parkes thought the list required revision; it was not of much use reporting erysipelas.

Dr. Coventon, of Montreal, said the regulations in force in his province worked well, and epidemic diseases were being stamped out.

Dr. Corbet held that compulsory notification of disease was an infringement of personal liberty.

It was carried with loud applause that notification should be compulsory in all countries, and that it is best effected by the dual system.

## DIVISION II.

### DEMOGRAPHY, INCLUDING INDUSTRIAL HYGIENE.

Mr. Francis Galton, F.N.S., the President, delivered the only opening address which was characterized by originality of subject and of treatment. It may be briefly described as the question of the transmission of exceptional qualities, whether physical or mental; together with the relative fertility of different classes and races and their tendency to supplant one another under various circumstances. The frequency with which one race has supplanted another over wide geographical areas is one of the most striking features in the evolution of mankind. Much more care is taken to select appropriate varieties of plants and animals for plantation in foreign settlements than to select appropriate types of men. The conditions in youth and the antecedent circumstances of those who have successfully endured change of climatic influence should be investigated, and conversely those who fail, so that we may have a guide as to the type of person who should be employed in tropical or other climates.

*The Relation of Occupation to Disease and Mortality.*—Dr. Ogle, Superintendent of Statistics in the Registrar-General's Office, pointed out that satisfactory statistics under this head could only be obtained in countries where the census returns gave the ages of persons engaged in each industry.

He then gave the following tables; the death-rate of clergymen being the lowest was taken as the standard of comparison and represented by 100:—

*Comparative Mortality of Men,* 25 *to* 65 *years of age, in different occupations,* 1881–2–3.

| Occupation. | Comparative mortality. | Occupation. | Comparative mortality. |
|---|---|---|---|
| Clergymen, priests, ministers | 100 | Carpenters, joiners | 148 |
| Lawyers | 152 | Cabinet-makers, upholsterers | 173 |
| Medical men | 202 | Plumbers, painters, glaziers | 216 |
| Gardeners | 108 | Blacksmiths | 175 |
| Farmers | 114 | Engine, machine, boiler-makers | 155 |
| Agricultural laborers | 126 | Silk manufacture | 152 |
| Fishermen | 143 | Wool, worsted manufacture | 186 |
| Commercial clerks | 179 | Cotton manufacture | 196 |
| Commercial travellers | 171 | Cutlers, scissors-makers | 229 |
| Innkeepers, liquor-dealers | 274 | Gunsmiths | 186 |
| Inn, hotel, service | 397 | File-makers | 300 |
| Brewers | 245 | Paper-makers | 129 |
| Butchers | 211 | Glass-workers | 214 |
| Bakers | 172 | Earthenware-makers | 314 |
| Corn millers | 172 | Coal-miners | 160 |
| Grocers | 139 | Cornish miners | 331 |
| Drapers | 159 | Stone, slate quarriers | 202 |
| Shopkeepers generally | 158 | Cab, omnibus service | 267 |
| Tailors | 189 | Railway, road, clay, etc., laborers | 185 |
| Shoemakers | 166 | Costermongers, hawkers, street-sellers | 338 |
| Hatters | 192 | | |
| Printers | 193 | | |
| Bookbinders | 210 | | |
| Builders, masons, bricklayers | 174 | | |

The causes on which the wide differences shown on the table depend are then considered and grouped under seven general headings, as follows:—

(1) Working in a cramped attitude, and especially in one that interferes with the action of the thoracic organs.

(2) Overwork, and especially sudden muscular efforts and strains.

(3) Dealing with noxious substances, such as lead, phosphorus, mercury, infected hides, etc.

(4) Working in ill-ventilated and overheated rooms.

(5) Alcoholic excess.

(6) Liability to accident.

(7) Exposure to inhalation of dust of various kinds.

Illustrating respectively the 4th, 7th, and 5th causes are the following tables:—

*Comparative Mortality of Men working in air of different degrees of purity from phthisis and respiratory diseases.*

| Air. | Occupation. | Mortality from | | |
|---|---|---|---|---|
| | | Phthisis. | Diseases of respiratory organs. | Phthisis and diseases of respiratory organs. |
| Pure . . . . . . | Fishermen . . . | 55 | 45 | 100 |
| | Farmers . . . . | 52 | 50 | 102 |
| | Gardeners . . . | 61 | 56 | 117 |
| | Agricultural laborers | 62 | 79 | 141 |
| Confined . . . | Grocers . . . . | 84 | 59 | 143 |
| | Drapers . . . . | 152 | 65 | 217 |
| Highly vitiated . | Tailors . . . . . | 144 | 94 | 238 |
| | Printers . . . . | 233 | 84 | 317 |

*Comparative Mortality of Males in certain dust-inhaling occupations from phthisis and diseases of the respiratory organs.*

| Occupation. | Comparative mortality from | | |
|---|---|---|---|
| | Phthisis. | Diseases of respiratory organs. | Phthisis and diseases of respiratory organs. |
| Coal-miners . . . . . . . . | 64 | 102 | 166 |
| Carpenters, joiners . . . . . | 103 | 67 | 170 |
| Bakers . . . . . . . . . | 107 | 94 | 201 |
| Masons, bricklayers, builders . . | 127 | 102 | 229 |
| Wool, worsted workers . . . . | 130 | 104 | 234 |
| Cotton workers . . . . . . | 137 | 137 | 274 |
| Quarrymen . . . . . . . . | 156 | 138 | 294 |
| Cutlers . . . . . . . . . | 187 | 197 | 384 |
| File-makers . . . . . . . . | 219 | 177 | 396 |
| Earthenware-makers . . . . . | 239 | 326 | 565 |
| Cornish miners . . . . . . | 349 | 231 | 580 |
| Fishermen . . . . . . . . | 55 | 45 | 100 |

*Mortality of Dealers in Liquor (25 to 65 years of age) from various diseases, compared with that of men generally of the same ages.*

| Diseases. | Mortality of Liquor dealers. | Mortality of Men generally. |
|---|---|---|
| Alcoholism | 55 | 10 |
| Liver diseases | 240 | 39 |
| Gout | 13 | 3 |
| Diseases of the nervous system | 200 | 119 |
| Suicide | 26 | 14 |
| Diseases of the urinary system | 83 | 41 |
| " " circulatory system | 140 | 120 |
| Other diseases | 764 | 654 |
| All causes | 1521 | 1000 |

Dr. Bertillon, Chief of the Statistical Department of Paris, then compared statistics obtained in Paris with analogous ones published in Britain and Switzerland.

M. Millet, of Berne, divided statisticians into two classes, the pessimists, to which he belonged, and the optimists, of which the two preceding speakers were good representatives. Innkeepers in Switzerland had a high mortality; they were of two kinds: solid, *i. e.*, those who had followed that vocation all their lifetime; and accidental, those who had come into the trade. He said this latter class raised the death-rate.

M. Körösi, of Buda Pesth, pointed out the connection between sedentary occupations and tubercular disease, and thought that it might be that the occupation was chosen on account of the state of health.

Dr. E. Duncan, of Glasgow, said that plumbers and painters in Scotland kept distinct in their trades, and he therefore had been able to investigate the influence of lead upon them, which could not be ascertained so well in England, where painters sometimes worked as plumbers. He found both classes suffered from lead-poisoning about equally.

Dr. Arlidge had examined a large number of patients suffering from lead-poisoning in the pottery trade, and found that not 1 in 700 had albuminous urine. The mortality of linen-workers was higher even than that of wool-workers.

*Can the People of Temperate Climates Live in the Tropics?*—Dr. Felkin, of Edinburgh, introduced the discussion of this question, which is coming to the front in connection with the "grab" for Africa by European States. For permanent residence he considered a comparatively high altitude was requisite. He divided the tropics into three vertical zones. The first extended up to a height of 3000 feet, with a mean annual temperature of 72° to 82° F.—the hot zone. The second or temperate zone extended from 3000 to 12,000 feet, with a mean annual temperature of 41° to 73° F.; this he would further divide into two parts, the higher and cooler (41° to 55° F.), and a lower warmer part, with a temperature of 55° to 73° F. The third zone lay above 12,000 feet up to 16,000 feet, and had a mean annual temperature of 30° to 41° F. As we proceed north or south of the equator, the boundaries of these zones are found at gradually diminishing elevations, and therefore heat, atmospheric pressure, and moisture vary at different latitudes.

For the British people and North Germans an altitude of 6000 to 10,000 feet was requisite in the tropics, and even these areas should be carefully selected, and all sanitary precautions taken. Although altitude might give an invigorating climate, the powerful sun, the rarefied air, and the absence of well-marked summer and winter detracted from its value.

Surgeon-General Sir Wm. Moore said that many persons experienced unpleasant effects at comparatively slight elevations. Even the elevated parts of the tropics were altogether free from the diseases of the lowlands, but they were of a modified kind. He did not consider that the temperate climate of elevation supplied the place of temperate climate of latitude.

Dr. C. E. Vanderburg argued that the colonization of tropical high lands by Europeans was impossible for physiological as well as economical reasons.

Mr. Clements Markham thought the influence of rainfall and climate on soil, affecting thereby the food supply, was much more important in considering this question than the effect of heat on the individual. He mentioned the West Indian and Bahama Islands and the plateaux of the Andes as places which white people had successfully occupied.

Prof. Stokvis, of Amsterdam, denied the existence of true tropical anæmia; the patients were pale, but the blood was quite normal.

Surgeon-General Ewart said that he agreed with Sir Wm. Moore that white people might exist in tropical hill climates if outdoor labor was not undertaken, but without that, colonization in the true sense of the term could not be said to take place.

*Medical Geography.*—Mr. Alfred Haviland read a paper on the influence of clay and lime stones on medical geography, illustrated by the distribution of cancer in women. By maps he demonstrated the prevalence of high cancer mortality in the low-lying valley areas characterized by clays which were subject to seasonal floods from the rivers traversing them. In districts which were comparatively high and dry the cancer mortality was low.

Mr. Wm. Topley (of the Geological Survey Office) said that wetness of soil appeared to be the main controlling factor in the distribution of diphtheria and phthisis.

Dr. Ogle expressed his doubts as to the accuracy of Mr. Haviland's conclusions about cancer. He had evidently not taken into consideration the fact that the subjects of cancer flocked to the large centres for operation.

Sir Henry Acland made some remarks on the extreme difficulty of the subject.

*The Influence of Parental Age on the Vitality of Children.*—Dr. Körösi, Director of Municipal Statistics in Buda Pesth, read a paper on this subject. The basis of the investigation was furnished by data upon the age of parents who have lost children below the age of 10, which data have been noted in this city for many years. Observations were made on the deaths of 29,813 children. His investigations led him to the conclusions that girls should not marry before the age of 20; that old men ought not to marry young women; women under 30, and even between 30 and 35 years of age, should avoid marriage with men above 50 years of age, but on the other hand women above 35 years need not fear to marry a husband of above 30, but these same women, and even those between 30 and 35, should avoid marriage with young men, as it seems probable that their children will be more exposed to hydrocephalus, or inborn debility. The most vigorous children issued from fathers of 30 to 40 years of age, the children of younger and older fathers dying somewhat oftener from uterine causes. It was curious that when the fathers were advanced in life above 60 years or more, the vitality of the children seemed to increase anew.

Mr. Galton thought that much useful information might be obtained by a careful study of well-kept stud-books.

Dr. Longstaff stated that another series of observations should be obtained in order to approach accuracy. It was essential to know for each country and for the various social classes the normal birth-rate in each successive year after marriage, distinguishing children born alive.

*Personal Identification.*—Col. Charles R. Greenleaf and Major Charles Smart, of the Medical Department of the U. S. Army, had prepared a paper on the methods of record used in the army. It was read by Col. Woodhull. Bertillon's anthropometric method was insufficient for court-martials, because of possible inaccuracies in measurement and because of allowable errors, but when height, age, and hair fairly correspond with coincident indelible marks, the former might be said to be practically primary evidence; body marks were, however, by themselves sufficient to distinguish an individual. The success of the system had already been proved, for out of sixty-two cases of suspected fraud sixty-one were found to be real.

The President of the Section, Mr. F. Galton, then demonstrated his method of obtaining registers of finger-prints for subsequent identification, and exhibited various sets of impressions, and photographs of impressions from three hundred different persons. The prints used are those of the bulbs of the ten digits. The patterns grow in size with the individual, but their general character and structure in all its minuteness remains unchanged throughout life. There was every facility in identifying finger-prints, as they could be arranged systematically, first, according to the pattern, and second, by attention to one or more of the minutiæ.

Three primary divisions are recognized, as the pattern is a "primary," a "whorl," or a "hoop." Each class is then divided into those that are symmetrical and those which are not. Some minute characteristic is selected for further identification; in each finger-bulb there are on the average at least twenty distinct points of reference, so that a degree of certainty could be rapidly attained beyond that by any other method.

Dr. Wilberforce Smith said that measurements could not be taken in inches with the accuracy that most people imagined; there was great liability to variation, especially in height; variations of an inch in the height of an individual took place each day.

Dr. Mouatt said that his experience in India showed that reliance upon external marks did not work in practice.

Sir Rawson Rawson said the advantage of the Bertillon method lay in the fact that a certain amount of instability was possible without affecting the general accuracy.

Dr. Bertillon said by his brother's method of measurement of the head, etc., and division into groups of great length, medium and short, a classification could easily be made. The measurement from root of nose to occipital protuberance was a very constant one, and never varied in the same individual.

Dr. Guillane, of Berne, thought there should be an international bureau.

*Physical Conditions of School Children.*—Dr. Francis Warner gave here the complementary part of his paper on this subject (*vide* Section IV.).

The physical signs observed were:—

The epicanthus, a fold of skin abnormally developed across the inner angle of the opening of the eyelids giving an appearance of great width between the eyes.

Overaction of the frontal muscles, causing horizontal creases. Corrugation, knitting the eyebrows, vertical creases are thus produced and may co-exist with frontals overacting. Orbicularis oculi relaxed with a fulness or bagginess under the eyes. Hand-balance nervous, wrist drooped, the palm slightly contracted laterally, the thumb and fingers extended backwards at their junction with the palm. Hand balance weak, as above with the digits slightly flexed. Lordosis—when the hands are held out an altered balance of the spine may be seen with arching forward in the lumbar region, while the part between the shoulders is thrown back. Mental dullness—from teacher's reports.

No information was recorded as to their feeding, or as to the presence of disease.

Certain localities tend to produce a larger percentage of defects than elsewhere. The poorer districts do not necessarily produce the worst made children. As a rule, boys are worse made than girls.

A committee appointed by the British Dental Association reported on an inquiry, which is being conducted with a view to a more exact knowledge of the condition of children's teeth at various ages.

Dr. Wilberforce Smith did not think Dr. Warner's methods likely to be of general service. It was a matter between personal skill and medical arithmetic, and he preferred the latter.

Dr. Cunningham regarded the question of sound teeth as one of the greatest importance to the nation. Mr. Ernest Hart said people looked with suspicion on investigations undertaken on a physical basis alone, but it was really the method which should be supported by the public.

It was agreed that "the duration of the day's work in relation to the health of the worker and its consequences on public health" be a subject for discussion at the next Congress. Other resolutions dealing with the collection of statistics as to insurance, wages, and branches of industry were also carried.

## FINAL MEETING.

The Congress was brought to a close by a general meeting, which dragged its weary length over 3½ hours; speeches congratulatory of one another were made by representatives of every nation present. It was announced that Herr Körösi has offered a prize of 1500 francs for the best work on the object of demography and its progress in the chief countries of Europe and the United States. Essays, which may be written in English, German, French, or Italian, must be sent to Herr Körösi, at Buda Pesth, by January 1, 1894. The name of the author is to be sent with it, but in a sealed envelope. The paper will be examined by an international committee of five statisticians elected by the Permanent Committee.

The total number of members who attended the Congress was just over 2700, considerably more than was expected.

*The Next Congress.*—Dr. Hewitt, of Minnesota, presented an unofficial invitation asking the Congress to meet in Chicago in 1893 at the time when the International Exhibition would be held there; but Prof. Corfield stated that as the next meeting of the International Medical Congress was to be held in Rome in 1893, it was undesirable that a meeting of the Hygiene and Demography Congress should meet in that year. It was therefore resolved to accept the official invitation from the authorities of Buda Pesth to meet there in 1894. There exists evidently some dissatisfaction at this decision, and it has been stated that efforts will be made to hold a Congress of Hygiene at Chicago in 1893. A resolution was also come to on the desirability of having a Tropical Section at the next Congress.

Has the Congress been a success? On the whole, yes; it has been well attended, and good work has been done; but it is impossible to deny, what was so universally expressed, that very general dissatisfaction existed in regard to the arrangements which had been made.

Sir Douglas Galton and his friends had (with the exception of Prof. Corfield) no connection with public health work, and to begin with, estranged the sympathies of the public health service of this country; but it was hoped that they would show such powers of organization that would excuse this primary mistake; unfortunately, no—the press here have had to use terms of this kind ill-arranged, embryonic, inadequate, raw inexperience, so much unnecessary, though not unreasonable grumbling; chaotic arrangements; lamentably defective. Indeed, if it had not been for the exertions of the Secretaries of Sections, the Congress would have been a failure. Nor must we forget the very successful efforts of our corporations, societies, and private individuals to entertain the visitors. Receptions and garden parties were given on every hand; palaces and noted houses, exhibitions, museums, and whatever might be interesting to visitors were thrown open on production of the Congress ticket.

The Prince of Wales presided at a representative gathering at dinner at the College of Physicians, and a brilliant banquet was given by the Public Health Medical Society. At this latter it was announced that Dr. J. S. Billings, of Washington, had been, with a few others, elected an honorary member of the Society.

# ABSTRACT FROM CURRENT LITERATURE.

IN CHARGE OF H. W. CATTELL, M.D.

*The* EDITORS *request that Reports of Papers read before Societies, Reprints of Articles, Letters from Physicians containing matters of General Interest pertaining to the Subjects in the Title-page of this Journal should be sent to the* EDITORIAL OFFICE, 913 WALNUT ST., PHILA., *marked for* CLIMATOLOGIST.

## BACTERIOLOGY.

**Action of Dead Bacteria in the Living Body.**—In the New York Medical Journal, under date of June 6, 1891, appeared an article by T. Mitchell Prudden, M.D., entitled "Studies on the Action of Dead Bacteria in the Living Body." This article was followed and continued on June 20th, by Drs. Prudden and Eugene Hodenpyl.

The first paper is largely a *résumé* of experiments by Pfeffer, Massart and Bordet, Gabritcheoskt, Backner, etc., upon the action of different substances associated with bacteria upon leucocytes or the chemotoxis excited by the proteid ingredient of the bacterial bodies. In the experiments described in the second paper the bacillus tuberculosis was chosen owing to the peculiarly direct and constant relationship between the germ and the lesions which it induces. The tubercle bacilli were cultivated upon peptone agar with 6 per cent. glycerine, and upon glycerine peptone bouillon. The solid masses of culture were scraped off from the agar or filtered from the bouillon. The bacilli were washed with sterilized distilled water and boiled in sterilized water from 1½ hours to 4 hours. In other cases or experiments the bacilli after washing were boiled from 2 to 4 hours in 50 per cent. glycerine and water, then filtered before an emulsion with water for injection was made.

The article says: "We have found that prolonged boiling, while often causing a considerable breaking up of the tubercle bacillus, does not interfere with its characteristic staining, and does not alter the morphology of many of the individuals of a culture; so that bacilli killed in this way and introduced into the body can be readily recognized at their seat of lodgment, even after the lapse of many weeks. Our experiments have shown that dead tubercle bacilli, separate from such of their metobolic products as are set free in the culture media, or are extracted by prolonged boiling in water or 50 per cent. glycerine, are capable of inducing marked effects upon the body-cells of the rabbit with which they are brought in contact. These dead bacilli are markedly chemotactic. When introduced in considerable amount into the subcutaneous tissue, or into the pleural or abdominal cavities, they are distinctly pyogenic, causing aseptic localized suppuration. Under these conditions they are capable, moreover, of stimulating the tissues about the suppurative foci to the development of a new tissue, closely resembling the diffuse tubercle tissue induced by the living germs. We have found that dead tubercle bacilli introduced in small numbers into the bloodvessels of the rabbit largely disappear within a few hours or days, but that scattering individuals and clusters may remain here and there in the lungs and liver, clinging to the vessel walls for many days without inducing any marked change in the latter. After a time, however—earliest in the lungs, later, as a rule, in the liver—a cell proliferation occurs in the vicinity of these dead germs which leads to the formation of new multiple nodular structures bearing a striking morphological resemblance to miliary tubercles. There is in them, however, no tendency to cheesy degeneration, and no evidence of proliferation of the bacilli, but rather a steady diminution in their number."

It seems that the new structures originate in a proliferation of the vascular endothelium under its stimulus of the dead and disintegrating germs. Control experiments were made by injecting boiled culture of bacillus diphtheria, bacillus coli communis, staphylococcus pyogenus aureus, wheat flour, and red pepper, and were practically negative.

The authors go on to say that if these results are confirmed by others it explains the absence of tubercle bacilli in many masses of tubercle tissue and in destructive lesions of chronic phthisis, and in tubercular lymph nodes if the morphological characteristics of these structures depend upon the disintegration of the bacilli which once found lodgment where they form.

It may be possible that also from old fibrous masses in the lung, stainable bacilli may be obtained, and yet these growths may be innocuous.

**Tubercle Bacilli in Railroad Carriages.**—DR. PRAUSSNITZ has conducted a number of experiments to determine if bacilli of tuberculosis are found in railroad carriages and whether they are a danger to the travelling public. He investigated the carriages which are employed from Berlin to Meran and are used greatly by consumptives. Ten compartments were examined; six were found free. In the other four bacilli were found but in small numbers, and the inoculation experiments which were made were negative, which would seem to show that the bacilli were not in an active state.

The conclusion drawn was that the ordinary methods employed in cleaning these carriages are a safeguard against tuberculosis. Unfortunately, however, the article does not go on and say what method *is* employed in cleaning said carriages, and it may vary on that particular railroad all the way from whisking a broom to sponging with a bi-chloride solution.—*The British Med. Journal*, June 13, 1891.

## LIFE INSURANCE.

**The Varying Significance of Intermittent Albuminuria.**—John Winters Brannan considers the three factors in the production of albuminuria to be:—

Changes in the composition of the blood; changes in the blood pressure, or rate of flow; and changes in the structure of the kidneys. He also divides the causes of intermittent albuminuria into three classes:—

*First*. Dyscrasic. (Hetero-albuminæmia—digestive, oxaluric, hepatic, and gouty.)

*Second*. Mechanical. (Cyclical, and albuminuria of adolescents.)

*Third*. Neurotic. (Mental anxiety, intellectual effort, and excessive physical fatigue.)

Out of 365 persons, mostly males, examined by the author for life-insurance purposes in the last seven years, 14.8 per cent. had more or less albumin in the urine. One case of intermittent albuminuria was supposed to have been caused by the eating of three raw eggs for breakfast every morning and another due to an excess of urea and urates. In one case a slight degree of chronic nephritis was found at the autopsy. It is the author's opinion that intermittent albuminuria will cause derangement of function sooner or later, and that this will be followed by a structural change in the kidney.

It is advised, in cases of albuminuria of doubtful origin, that a quantitative analysis of the urea be made. If the individual is excreting from 20 to 30 grams of urea daily, the urinary tubules at least are not seriously affected.—*New York Medical Journal*, July 4, 1891.

## MINERAL SPRINGS AND SANATORIA.

**Pneumo-therapeutic Institute of Brussels.**—The pneumo-therapeutic Institute of Brussels is described by HOVENT, its physician-in-chief, as being the largest and most complete institute of its kind in the world.

The establishment is supplied with the apparatus of Maurice Dupont, Geigel & Mayr, Hovent, Schnitzler, Solis-Cohen, Tobold, and Waldenburg, and furnishes the following services:—

1st. Baths of compressed or rarefied air, with or without supersaturation of oxygen.

2d. Inhalations of compressed air with expirations into rarefied air.

3d. The sale of oxygen gas in the city, the country, and even abroad.

4th. Electro-therapy by static and dynamic machines.

Baths of compressed or rarefied air are given by means of seven iron chambers of varying capacity; some being capable of comfortably holding from two to ten persons. The chambers are well constructed and supplied with several glass windows and two doors, a large and smaller one. The doors are double, so that there is a lobby formed in which the doctor entering by the outer door can shut himself in, and then, equalizing the pressure, can open the inner door and speedily reach the patient without any great alteration in the pressure. The smaller door, also duplicated, is for the passage of books, or whatever may be desired, to the patient. Electric bells, elbow-chairs, toilet tables, manometer, thermometer, hygrometer, etc., are contained in the room. Separate pipes lead to this chamber from underground tanks filled with compressed air, rarefied air, oxygen, and nitrogen. The quantity of the air, oxygen, or nitrogen introduced, or the quantity of air removed, is measured. Ten tanks, of several thousand liters capacity, and strong enough to withstand a pressure of seven or more atmospheres are filled or exhausted by a gas engine of 8-horse power. If compressed air be desired, the pipe connecting the tank with compressed air is opened, and the air rushes in until the necessary pressure is obtained. If rarefied air be desired, the air of the chamber rushes out by connecting it with the exhaust tank. As an ordinary sitting lasts about two hours, the foul air is constantly being withdrawn from the occupied chamber and purified by being passed through several Wolff's bottles filled with chemicals. It is again introduced, and thus the same degree of positive or negative pressure is always maintained. If it be desirable to employ medicinal agents, they are placed in the path of the air-current or vaporized by means of boiling water.

Asthma is the principal affection for which compressed air-baths are employed, and it is claimed for this mode of treatment that 80 per cent. of recoveries are obtained in from twenty to sixty sittings. Dyspnœa disappears during the first sitting, when the pressure of the air is sufficient; this result becoming permanent only after a number of sittings. In whooping-cough a cure is obtained after ten to fifteen sittings, and the child generally gains one to three pounds in weight. Joccoud, Oertel, and Bertin are quoted as favoring the use of aërotherapy in consumption. Heart disease is not considered a contraindication, as by the use of certain precautions even this class of patients have been successfully treated. In catarrhal deafness the compressed air effects a natural catheterism. Among other diseases mentioned as being favorably influenced or cured by the compressed air-baths are pulmonary emphysema and congestions, chronic bronchitis, coryza, chronic pharyngitis, laryngitis, chronic amygdalitis, chlorosis, anæmia, diabetes, albuminuria, gout, obesity, and dysmenorrhœa. The rarefied air bath has not been so well studied, but is employed, as a reproduction of mountain atmosphere, for rickety children when the thorax is deformed, and alternately with the compressed air-bath to determine whether a patient should be sent to the mountains or seashore. (Abstract of paper written by Hovent at the request of J. Solis-Cohen, and read by Dr. A. A. Eshner before the Phila. Co. Med. Soc., June 10, 1891.—*Med. and Surg. Reporter*, July 4, 1891.)

**Bohemian Bouquet.**—"The northwestern part of Bohemia, near the Saxon border, gives abundant evidences of extinct volcanic action, and here, at an elevation of nearly two thousand feet above the sea level, are a number of celebrated spas, of which the three most famous are known facetiously as the Bohemian Bouquet. This nosegay is supposed to be formed of three roses, yellow, red, and white respectively. The oldest and most famous spring, that of Carlsbad, is represented by the yellow rose, for here from all Europe and from distant countries are gathered patients who are yellow with jaundice; in like manner the red rose of Marienbad symbolizes the ruddy noses of high livers, who assemble there every summer to cool off their system with the beneficent saline waters; the pale rose of Franzensbad matches the complexion of the anæmic women who come from far and wide to restore their health and to improve their blood by the saline chalybeate waters, hoping also to get old pelvic exudations absorbed and congestions of the uterus relieved by the famous mud-baths for which this locality is noted.

"The whole system of taking the water is systematically combined with as much walking as the patients can endure, and health is regained by using the waters with faith, hope, and expectant attention, and also by plenty of exercise and a careful diet, good music and cheerful society, early hours and steady habits of life."—E. W. Cushing, in *Journal of Balneology and Dietary*, April, 1891.

## OCCUPATION.

**Miners' Nystagmus.**—A discussion has been going on in the columns of the British Medical Journal in regard to the cause of miners' nystagmus. Tatham Thompson (British Medical Journal, February 14, 1891) holds that the cause is due to defective illumination; while Simpson Snell (British Medical Journal, July 11, 1891) wishes to show that the prime cause of miners' nystagmus is to be found in the strained attitude which a certain portion of the workers in the coal-pit are forced to assume while at their work, and that the question of safety-lamps and illumination only occupies a secondary position. The last writer has treated over 500 cases of colliers suffering from nystagmus, and in order to better familiarize himself with the subject has taken every pains to personally inspect the men at work, and to gain information which would in any way throw light upon the subject. A complete book is promised which will illustrate by engravings and photographs the various kinds of work pursued in the pit.

## PREVENTIVE MEDICINE.

**Treatment of Pulmonary Tuberculosis by Tuberculin.**—C. Langenbuch, assisted by P. Wolff, has treated 99 cases of pulmonary tuberculosis by means of tuberculin. Of this number there were 33 recoveries and 40 cases that improved—perhaps the best results that have been published from the tuberculin treatment. The large doses were abandoned, and minute doses were adopted which would not produce fever or general symptoms. An elaborate table of all the cases is given, and a comparison is made with the former modes of treatment, as follows:—

| | Without tuberculin. | With tuberculin. |
|---|---|---|
| Died | 45 | 21 |
| Living | 54 | 78 |
| | 99 | 99 |

—*Deuts. Medicin. Wochen.*, July 23, 1891.

**On the Diagnostic Value of Laveran's Organisms.**—H. Toulmin makes the statement that a careful and experienced examiner may always find Laveran's organisms in malarial fever. The writer's method of searching for the plasmodia is to obtain the blood from the lobe of the ear, the part having been previously well washed and dried. A clean cover-glass is to be immediately applied to the exuding drop of blood without touching the skin, and quickly transferred to a slide; the cover-glass is then to be gently pressed down, so as to have a uniform field. The microscopic examination should be made within two hours. While an immersion lens brings out the bodies more distinctly, a good one-seventh objective is of sufficient power.—*The Medical News*, September 19, 1891.

## RACE.

**The Brain of Laura Bridgman.**—Every one has read accounts of Laura Bridgman, and of the marvellous results obtained by Dr. Howe in educating her. Losing her sight, hearing, and nearly all sense of smell and taste, at the age of two, she remained practically without education until the age of nearly eight years, when she was placed under Dr. Howe's care. A careful record of her intellectual progress was kept for many years, and, in 1878, Prof. Stanley Hall made a valuable series of physiological and psychological tests upon her. She was shown to have some sense of taste, but practically none of smell. She could not hear even the loudest noise, but appreciated vibrations. Rotation made her dizzy. Her tactile sense was two or three times more acute than normal. Mentally she was eccentric, but not defective; she lacked certain data of thought, but not the ability to use what data she possessed. Her emotions were very lively and she had a certain hysterical tendency. She died in 1889, at the age of sixty. Her brain was obtained and has been studied by Dr. H. H. DONALDSON, of Clark University. (*American Journal of Psychology*, Sept. 1890.) Dr. Donaldson's report is a model of careful scientific work, and contains much of interest to students of anatomy. But his findings are decidedly meagre and show little more than would be expected. The brain weighed about one thousand two hundred grammes. This is considerably below the average for women, which for Anglo-Saxon and German races is about one thousand two hundred and seventy-five. Considering her small stature and body weight the brain, however, was not especially small.

An examination of the lobes and convolutions showed that there was some defect in the centres for articulate language; also defect in the occipital lobes, especially the right (visual centre), and in the temporal lobes, especially the tips. This last condition may have been due to her imperfect sense of smell and taste. The fissure of Sylvius was short and the posterior corpora quadrigemina small. A careful microscopical examination might give some important information as to the central course of the optic and olfactory traits, but this has not yet been done. There was nothing in the appearance of the brain which would ally it to low type, criminal and insane brains.—*Editorial in Medical Record*, May 30, 1891.

## SANITARY SCIENCE.

**Recent Progress in Public Hygiene.**—SAMUEL W. ABBOTT has prepared a few interesting and valuable extracts of some recent papers and books on Public Hygiene. The article appeared in two numbers (March 19th and 26th, 1891) of the Boston Medical and Surgical Journal. A summary of the different abstracts follows:—

*Use of Compressed Air for Sanitary Purposes* (Zeitschrift für Hygiene, 1890, p. 507).—In several of the German cities companies have been organized for the purpose of supplying cities with compressed air; the cost will be about 25 cents for 420 cubic feet, at a pressure of 6 atmospheres. Numerous methods of application will at once suggest themselves to the sanitarian and engineer.

*Removal of Foul Air from Compartments* (Zeitschrift für Hygiene, 1890, p. 507).—From experiments made by Budde, of Copenhagen, as to the best plan of removing foul air from a room, it was found that a longitudinal exhaust flue at the bottom of the room extracts the largest volume of polluted air in the most economical mode, as it insures the fullest possible utilization of the artificial heat produced within the chamber.

*Air Filtration* (Zeitschrift für Hygiene, vol. vii. p. 379).—Karl Möller, the first to filter air upon a large scale for industrial purposes, points out certain erroneous deductions of Petri. It is stated that the cloths of Petri's filter were arranged at right angles to the current, that the cloth was not first sterilized, that abnormal quantities of air were passed through, which were beyond the straining capacity of the cloth, and that a large number of germs had merely been blown from the surface of the cloth by the air current.

*On the Disinfection of Vaults with Lime* (Zeitschrift für Hygiene, vol. vii. p. 363).—E. Pfhul, of Berlin, uses for the disinfection of 100 litres of excreta daily from 1 to 1½ litres of slaked lime, the larger quantity being for tubs and pails. There should be a thorough mechanical stirring, and no reliance should be placed upon a mere hand-mode of mixture.

*Disposal of the Dead by Cremation* (Schweizersche Bauzeitung, xiv. p. 37).—The system of cremation adopted by Emile Bourry, of Zurich, can be built for $10,000, exclusive of the cost of the land. The heat developed by the combustion of the coke is not only applied to the cremation of the body, but is also stored up by a cellular system, through which air is passed, thus diminishing the cost and time for a second cremation. It requires 8 to 10 hours to heat the furnace preparatory to the introduction of the body, the time of burning being 2 hours without and 2½ hours with a coffin. The temperature is 700° to 800° C. Almost two tons of coke are employed for a first heating, a second one using much less on account of the storage of the heat. The whole operation, if desired, can be carried on in view of the relatives and friends of the deceased. Another advantage claimed for this system is that the chimney, 32¾ feet in height, may be concealed within the building.

*Greening of French Vegetables by Copper.* (A Report on the Greening of Fresh Vegetables with Sulphate of Copper, Glasgow, Nov. 24, 1890.)—The canning of vegetables in France takes a capital of $8,000,000, employing 20,000 people. The practice of using copper for the greening of vegetables was introduced into France near the close of the last century, and is done, not that the vegetable may be the better preserved, but merely that they may present a more pleasing color to the eye. The French government has for a long time prohibited the use, in France, of vegetables thus prepared, while tolerating their export. At the persistent demands of the manufacturers this prohibition has, however, been lately withdrawn. The local sanitary authorities of Glasgow have taken summary action against this objectionable form of adulteration, and much blame the French government for permitting the use of copper for this purpose.

*Death from Water Containing Lead.* (Annual Report of the Health Office of Sheffield, 1889.)—A servant girl, aged 21, died from the effects of lead being in her drinking water. The symptoms were well-marked, and all other causes were excluded by the physicians in charge. A quantitative examination of the water showed 0.4 to 0.5 grains of lead per gallon.

*Prevention of Smoke Nuisance.* (Public Health, 1890, pp. 236, 251.)—Much has been accomplished of late for the relief of the smoke nuisance in England. Two methods are described: First, the furnace and grate bars are so arranged that the coal is converted into coke in the forepart of the furnace. The gases, which are here liberated, are consumed as they pass over the incandescent mass in the back part of the furnace. The coked coal is then burnt without disengaging the carbon. Second, Elliott's smoke annihilator. The smoke is driven into a chamber and is thoroughly churned with water by a revolving fan, the carbon, tarry matter, sulphur, and ammonia being arrested in the wash water, so that the steam, carbonic acid, and colorless gases alone escape up the chimney.

*Vital Statistics.* (Studies in statistics by George Blundell Longstaff, London, 1891.)—G. B. LONGSTAFF has used the census reports of different countries and the registrars-generals' returns to prepare some vital statistics which are of value to the physician and the sanitarian. One table is given showing the rise or fall in the death-rates, per million persons living in England and Wales, from various causes or groups of causes. Averages of quinquennium, 1875–1879, are compared with averages of quinquennium, 1850–54.

The largest gain is in the zymotic diseases, no less than 57 per cent. of gain being shown in fever, which chiefly includes typhus and typhoid.

The mortality of diphtheria in the rural districts was found, however, to be higher than that in cities. Taking 1000 as the mortality of the densely settled districts, we have:—

| | | | | |
|---|---|---|---|---|
| Mortality | from | diphtheria of | dense districts | 1000 |
| " | " | " | medium districts | 1178 |
| " | " | " | sparse | 1507 |

**Heat Storage in a Gas-stove.**—The ordinary gas-stove has the disadvantage of becoming cold as the gas is turned off. In order to prevent this, ED. WERDENBERG, of Basel, Switzerland, has arranged to have the heat applied to a fireproof storage compartment. As the substance of which this compartment is composed radiates the heat but slowly, a continuous heating of the room is obtained. This gas-stove is also connected with the chimney so as to act as a ventilator to the room and to carry off the products of combustion of the gas.—*Fortschritte der Krankenpflege*, January, 1891.

**Free Ventilation for Gasoline Stoves.**—N. K. MCCORMICK reports two deaths from inhalation of gases generated by a gasoline stove. A child exposed to the same poison, however, recovered. The author considers that these accidents would be more common were it not for the fact that gasoline stoves are used almost exclusively during the warmer months of the year, when free ventilation is obtained by means of open windows and doors. It is therefore advised, whenever gasoline stoves be used, that there be a sufficient supply of oxygen, in order that the products of combustion may be as perfect as possible. As bath-rooms are usually small in size and poorly ventilated, the practice of heating water here by gasoline stoves cannot be recommended, as there is danger of the bather becoming unconscious and being drowned in the water heated for the bath.—*Medical News*, May 9, 1891.

**Automatic Carbon Dioxide Register.**—Prof. A. WOLPERT, of Nuremburg, has prepared an automatic apparatus for the estimation of the purity of the atmosphere by means of the amount of carbon dioxide contained in the air. This air-tester is so regulated that by a comparison to a standard dial, one is able to determine at once the amount of carbon dioxide in a room, and thus judge if the ventilation is consistent with the standard of health. The great advantage possessed by the use of this machine, from an economic point of view, is the fact that there is no need of changing the air of a room if it be found by the air-tester to be pure, and thus the cost of extra fuel can often be saved.

Printed on the dial are the words *very pure*, *pure*, *passable*, *bad*, *very bad*, and *altogether bad*, and a table is posted telling the amount of $CO_2$ these words indicate in 1000 parts of air. On the back of the register is the following scale:—

| | | | | |
|---|---|---|---|---|
| Very pure when less than | 0.5 | parts $CO_2$ per | 1000 of | air. |
| Pure when from | 0.5 to 0.7 | " | " | " |
| Passable " | 0.7 to 1 | " | " | " |
| Bad " | 1 to 2 | " | " | " |
| Very bad " | 2 to 4 | " | " | " |
| Altogether bad over | 4 | " | " | " |

The apparatus is arranged as follows: Upon a bracket is placed a low flat vessel, filled with a standard solution of sodium hydrate, colored red with phenol phthalein. To this solution a few drops of oil are added. This prevents the liquid from coming in contact with the carbon dioxide of the air until the proper time. By means of a syphon, which is attached to a cork floating on the liquid, the fluid is dropped automatically into a tube, one-half meter in length. This tube is prepared of a white transparent glass, so as to show off the color of the solution to the best advantage. The syphon is so arranged that at a temperature of 68° F. one drop falls into the tube every two minutes. As the solution falls from the syphon to the tube, the carbon dioxide of the air has an opportunity of coming in contact with the liquid for a constant period of time. If the air is very pure, the coloration will be unaffected. If the air contains $CO_2$, the color of the standard solution will become lighter from contact of the solution with the air. It would therefore follow that the lighter the solution, the more $CO_2$ is contained in the air at that time. By reference to the attached color scale, an approximate, but sufficiently accurate, result for ordinary purposes can readily be obtained. The apparatus should not be placed near the fire or in the direct rays of the sun.—*Fortschritte der Krankenpflege*, Jan. 1891.

**Prevention of Floods in Italy.**—The destruction of the forests in Italy has been carried on to such an extent that when it rains on the mountains there is nothing to prevent the water from forming torrents and inundating the valleys below. In order to avoid this, the Italian government has decided to offer a series of twelve prizes, ranging from $200 to $60, both for the replanting of the hillsides, and for the regulation of the water-flow down the sides of the mountains. These prizes are divided into two sets, according to the amount of ground cultivated and drained, and are, therefore, open to both large and small property owners. Unsuccessful competitors in the contest are to be encouraged by silver and bronze medals.—*The Lancet*, May 9, 1891, p. 1058.

## SPECIAL DISEASES.

**An Unnamed Fever of the South.**—In a communication to The Medical Record, July 18, 1891, W. A. PLECKER states that he has treated nearly three hundred cases of a fever for which he can find no name in the text-books. This disease has been described by various authors in the Southern medical journals and has been discussed in many of their medical societies. In a lengthy discussion of the subject several years ago in the Birmingham, Alabama, Medical Society there seemed to be an equal division of opinion as to its being of typhoidal or malarial origin. It has been called typhoid-malaria, typho-malaria, bilious, and typhus fever. The writer considers that those cases reported by Evans (Medical Record, May 30, 1891), in an article on *Is the Contagion of Typhus Fever always Imported*, were of this class also. In none of the cases treated by the author were there any indications which lead him to believe that they were produced by the poison of either typhoid, typhus, or malaria. There was no delirium except in a limited number of cases, and then only for a few hours when the fever was at its highest. Constipation was the rule, and the intestinal symptoms of typhoid were never present, with the exception of hemorrhage in two cases. The eruption of typhoid or typhus was never observed, though sought for in many cases. One point alone would exclude either of these fevers, and that was the termination—every case ending in complete recovery except one, which was accompanied by glaucoma and the loss of one eye. Malaria was excluded by the regular continuing of the fever and the total absence of results from the use of quinine. The fever usually made its appearance gradually, and went in the same manner, the evening temperature being, as a rule, the highest. The temperature ranged from 100° to 103° F. in the milder cases to 106° F. in the more severe. The author considers the cause in the majority of cases to be the use of impure drinking water, it containing too large a percentage of vegetable matter, and not necessarily contaminated by disease-germs or sewage. This is shown by the fact that those who used the water from the mine escaped, while those using well water and surface water were affected. The men who worked in the mine were less affected than their families, due no doubt to their drinking the mine water while at work. The treatment should be mainly prophylactic; absolute rest in bed and proper diet; strychnine is useful at the beginning; antipyrin, mineral and vegetable acids, tonics and occasionally laxatives are indicated. Quinine is not only useless, except as a tonic, but renders the patient more uncomfortable if given in full doses.

Plecker desires that some suitable name be given to this disease in order that it may be separated from those diseases with which it is usually confounded.

# THE CLIMATOLOGIST.

## A MONTHLY JOURNAL OF MEDICINE.

VOL. I. NOVEMBER 15, 1891. No. 4.

"INTRODUCTION.

"The object of this JOURNAL is to promote original investigation, to publish papers containing the observations and experience of physicians in this country and Europe on all matters relating to CLIMATOLOGY, MINERAL SPRINGS, DIET, PREVENTIVE MEDICINE, RACE, OCCUPATION LIFE INSURANCE, AND SANITARY SCIENCE—and in that way to supply the means by which the general practitioner and the public at large will become better acquainted with the diseases of this country and Europe, and better armed to meet the requirements of their prevention or cure. The study of these subjects in this country is exciting great and increasing interest, and all admit that, from the little knowledge already possessed of its resources, possibly every known combination of atmospheric condition, soil, altitude, climate, or mineral springs, is to be found on this continent. It is confidently expected that *a journal devoted to the study of all diseases into which climate, soil, race, occupation, hereditation, diet, contagion, etc., enter more or less as factors*, will receive the encouragement of all, and become eventually an authority upon all subjects which are included in its title, although a thorough review of all progress in the departments mentioned will not be neglected. Especial attention will be given to the publication of *original material*, and it is to be hoped that physicians of all sections of the country will send papers upon any subjects which will be of general interest—such as the diseases of their locality—those incident to occupation, race, or climate, the study of epidemics, the questions of proper food, of the water supply, its potability and distribution, and all matters relating to drainage and diseases dependent on it.

"Original papers based upon experimental studies, or laboratory investigations in bacteriology, will form a prominent portion of the material presented during the year.

"Special attention will also be paid to the subject of health resorts, descriptions of Sanitariums with special reference to their suitability to certain cases, and the proper selection of patients to be benefited by different resorts. The utmost care will be taken that this JOURNAL shall assume and maintain the highest scientific character. It will be absolutely independent in its principles—*fair towards all*. It will depend for its maintenance upon the support given to it by the profession, as it is not published in the interest of any special section or clique."—*August*, 1891.

# THE CLIMATE OF FLORIDA.

By JOHN P. WALL, M. D.,

TAMPA, FLORIDA.

(Continued from page 161.)

It will be observed from the table that the relative humidity of the atmosphere is pretty uniform throughout the year; though the amount of absolute humidity for summer is about twice what it is in the winter, dependent, of course, upon the higher temperature of the summer. According to Gen. Greely's estimate of absolute humidity based on 10 years' observation, 1876–1886, the absolute humidity for the month of January is for the northern part of the State 3 grains of water to the cubic foot of air; for the base, or neck of the peninsula, 4 grains of water to the cubic foot; along the 28th parallel of N. latitude from the Atlantic to Tampa Bay on the Gulf, 5 grains of water to the cubic foot; and for the extreme point of the peninsula and Key West, 6 grains of water to the cubic foot. The amount of absolute humidity for the month of July is 9 grains of water to the cubic foot of air for the entire State. Of course, between January and July and between July and January—and even in the latter month itself—the absolute humidity must necessarily vary according to temperature, as the capacity of air to contain aqueous vapor is dependent almost entirely on temperature. The diathermancy of the air is considerably obstructed by diffusion through it of aqueous vapor, and consequently the heat of insolation in summer is not so excessive as might be inferred in consideration of the latitude alone; and likewise the terrestrial radiation at night is retarded or obstructed by the same cause, so that extremes are avoided.

*Mean relative humidity at stations of the Signal Service in Florida for each month and the year,* 1886.

| Station. | Jan. | Feb. | March. | April. | May. | June. | July. | August. | Sept. | Oct. | Nov. | Dec. | Year. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cedar Keys . . . . | 87 | 83 | 86 | 81 | 77 | 81 | 80 | 80 | 79 | 73 | 72 | 83 | 80 |
| Jacksonville , . . . | 79 | 78 | 78 | 74 | 69 | 77 | 80 | 82 | 82 | 80 | 76 | 83 | 78 |
| Key West . . . . . | 83 | 84 | 77 | 76 | 73 | 75 | 76 | 74 | 75 | 76 | 76 | 81 | 77 |
| Pensacola . . . . . | 76 | 69 | 77 | 74 | 74 | 78 | 81 | 80 | 78 | 71 | 74 | 76 | 76 |
| Sanford . . . . . . | 77 | 76 | 76 | 74 | 72 | 81 | 85 | 81 | 80 | 80 | 72 | 78 | 78 |

Of course, as might naturally be expected of a climate with the temperature and humidity of that of Florida, heavy dews in clear, still nights are always present; and during the winter and spring fogs in the night and early morning are not uncommon. Fogs are, however, somewhat worse on the Atlantic Coast and along the St. John's River than on the Gulf side of the peninsula. This is due to two causes: First, to the more level character of the country with its large bodies of comparatively still, fresh water in the shape of sluggish streams and lakes; and second, by the winds, warmed and vapor-ladened by their passage over the Gulf Stream, passing over the cold waters which shoal up along the coast. And it is probable that to the presence of these fogs, interfering with solar and terrestrial radiation, is to be attributed what little, if any, difference of temperature between the two coasts of the peninsula there may be.

"Mists and fogs are generally of local distribution, and are produced by two methods: first, by warm, very moist winds blowing over the surface of cold water; and second, by cold winds passing over very warm water or damp moist ground. Consequently, fogs occur with the greatest frequency in those regions, on or near larger bodies of water, where great differences in temperature are found in comparatively short distances."[1]

With the Atlantic on the east and the Gulf of Mexico on the south and west the temperature of Florida, and especially that

[1] American Weather, by Gen. A. W. Greely.

of the peninsula, is very much ameliorated by the constant sea breezes, and the climate rendered remarkably equable and genial. The regular alternation of the land and sea breezes prevents, especially during the hot season, the discomforts and sufferings of excessive heat which is usually associated with the wind in the lower latitudes of the north temperate zone. The constant breezes also favor evaporation by which much of the sensible is converted into latent heat, producing a powerful refrigerating effect. The average velocity of the wind for each month and the year 1887 is given in the table; though it is not to be supposed from these averages that the wind is blowing uniformly all the time at those rates, for it is not unfrequently the case that it will be in motion only for a certain number of hours each day, and during that time may exceed the average as computed for the whole day. Another table gives its maximum velocity for the same year as observed at the different signal stations in Florida. It is to be regretted that there are no signal stations located towards the centre of the peninsula; and, consequently, those located on the coast can hardly give a wholly correct idea of the interior climate, especially as to rain-fall and the velocity of the wind.

There is not much variation in the atmospheric pressure as indicated by the barometer, except at those times of cyclonic and anticyclonic disturbances, when, of course, the barometer falls or rises as the whole or parts of the State may be swept by low or high area pressures.

The greater portion of the State is situated in the calm belt, *i. e.*, is neither subjected to the trade winds of still lower latitudes, nor to the westerly winds of the higher latitudes. The northern border and the extreme southern part of the peninsula may at times come within the sweep of these regular winds, but it is not a constant occurrence; nor, when it does occur, is it of long continuance.

Having, so far as possible, presented all the meteorological data within reach—though sufficient, it is hoped, to give clear indications of the normal climatic conditions of Florida—it may not be amiss to conclude with a kind of general review of the subject, with some observations from a sanitary standpoint.

It will be noticed that the absolute range of temperature for the year is from 62° F. to 82° F., which is less than that of any other State in the Union for the same year, 1888, not even excepting California, where the annual range is from 60° F. to 122° F.; while at Bidwell, Tex., the lowest is 25° F. in January, and the highest 105° F. in July. The annual range of the thermometer in other States, as set forth in the Signal Service Report for the year 1888, is as follows: Alabama, 89° F.; Arizona, 108° F.; Arkansas, 103° F.; Colorado, 132° F.; Connecticut, 119° F.; Dakota, 150° F.; District of Columbia, 90° F.; Georgia, 85° F.; Idaho, 132° F.; Illinois, 132° F.; Indiana, 114° F.; Indian Territory, 124° F.; Iowa, 142° F.; Kansas, 129° F.; Kentucky, 98° F.; Louisiana, 83° F.; Maine, 111° F.; Maryland, 101° F.; Massachusetts, 119° F.; Michigan, 128° F.; Minnesota, 150° F.; Mississippi, 89° F.; Missouri, 123° F.; Montana, 171° F.; Nebraska, 139° F.; Nevada, 137° F.; New Hampshire, 125° F.; New Jersey, 102° F.; New Mexico, 114° F.; New York, 112° F.; North Carolina, 86° F.; Ohio, 112° F.; Oregon, 131° F.; Pennsylvania, 122° F.; Rhode Island, 113° F.; South Carolina, 92° F.; Tennessee, 98° F.; Texas, 118° F.; Utah, 140° F.; Vermont, 119° F.; Virginia, 96° F.; Washington Territory, 136° F.; West Virginia, 101° F.; Wisconsin, 136° F.; Wyoming, 145° F. The mid-summer maximum temperature in all these States and Territories is generally as great as in Florida, and at some points in these States and Territories much greater, while the minimum temperature may approximate or be below zero.

"The character of any climate is perhaps characteristically shown in no more forcible manner than by its temperature *variability*. This is obtained by noting the changes which take place in the mean daily temperature from day to day, regardless of the fact whether the temperature rises or falls. . . . . As a rule, the variability is greatest in January over the United States, and least in either July or August. . . . . It is evident that the only portions of the United States where the changes from day to day are not of a very decided character is the Pacific Coast region, Arizona, and southern Florida. . . . . During July and August the variability is small throughout the entire United States, and along the Pacific Gulf, and South Atlantic coasts amounts on the average to only a degree and a half; the smallest being 1.0° at San Diego, and the largest 2.0° at Jacksonville. The largest summer ranges are found in Lake Superior region, Dakota, and Montana, generally varying between four and six degrees."[1]

The climate of the peninsula of Florida is essentially that of a marine as contra-distinguished from a continental climate.

"One of the most important elements of any climate is its range of temperature, which marks it as continental or marine.

"The marked feature of a continental climate is the great difference between its extremity of temperatures, whether of day, month, or year. The greatest differences occur in the interior of continents, where the small amount of aqueous vapor in the air permits rapid radiation in winter and a high degree of insolation in summer. These differences may be called extreme in North America, where they almost equal the excessive ranges of Central Asia.

"On the contrary, a marine climate is characterized by small ranges and a general freedom from violent changes."[2]

Having on both sides vast expanses of ocean, the climate of the Florida Peninsula has, as compared with the other Gulf States, the characteristic features of a marine climate well marked, which render it remarkably equable and proverbially agreeable. The equability of the winter temperature is occasionally interrupted for a day, or a few days at most, by a north or northwest wind following rain or cloudy weather, of a cold dry character, resulting from abnormal distribution of atmospheric pressure. Similar disagreeable and violent cold winds are experienced in many other regions. Among these may be mentioned the well-known *mistral*, a northwest wind which blows from eastern and central France down on the Mediterranean along the Riviera; the northeasterly *gregale* of Malta, the northerly *tramontana* of the Adriatic, and *bora* of Trieste and Dalmatia.

[1] American Weather, by Gen. A. W. Greely. [2] Ibid.

*Maximum velocity of the wind (in miles per hour) at the Signal Service stations in Florida for each month of* 1887.

| Station. | Jan. | Feb. | March. | April. | May. | June. | July. | August. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cedar Keys . . . | 39 | 32 | 41 | 28 | 26 | 28 | 54 | 35 | 30 | 34 | 27 | 23 |
| Jacksonville . . . | 30 | 32 | 24 | 39 | 28 | 28 | 42 | 34 | 24 | 34 | 24 | 36 |
| Key West . . . . | 42 | 35 | 37 | 38 | 32 | 24 | 25 | 34 | 42 | 36 | 48 | 20 |
| Pensacola . . . . | 28 | 28 | 24 | 21 | 22 | 22 | 36 | 24 | 36 | 46 | 20 | 36 |
| Sanford . . . . . | 28 | 21 | 25 | 34 | 27 | 26 | — | — | — | — | — | — |
| Titusville . . . . | — | — | — | — | — | — | 30 | 38 | 40 | 40 | 58 | 45 |

*Average velocity of the wind (in miles per hour) at Signal Service stations in Florida for each month and the year,* 1887.

| Station. | Jan. | Feb. | March. | April. | May. | June. | July. | August. | Sept. | Oct. | Nov. | Dec. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cedar Keys . . . . | 9.3 | 9.6 | 9.1 | 10.5 | 8.5 | 8.2 | 10.0 | 8.7 | 9.9 | 10.0 | 8.1 | 10.3 | 9.4 |
| Jacksonville . . . . | 5.8 | 5.3 | 8.7 | 7.2 | 7.3 | 6.9 | 8.8 | 7.8 | 7.9 | 7.8 | 6.9 | 6.6 | 6.8 |
| Key West . . . . . | 11.3 | 12.9 | 11.1 | 10.5 | 8.5 | 7.7 | 6.1 | 8.9 | 10.0 | 11.7 | 12.0 | 10.9 | 10.1 |
| Pensacola . . . . . | 7.4 | 7.2 | 6.8 | 7.5 | 7.9 | 7.8 | 6.8 | 6.2 | 8.4 | 8.4 | 6.0 | 8.5 | 7.4 |
| Sanford . . . . . . | 7.2 | 6.2 | 6.4 | 8.0 | 6.4 | 6.0 | — | — | — | — | — | — | — |
| Titusville . . . . . | — | — | — | — | — | — | 7.8 | 9.9 | 12.4 | 9.6 | 8.8 | 8.8 | — |

*Number of days showing direction of wind at the Signal Service stations in Florida for the year* 1889.

| Station. | North. | North-east. | East. | South-east. | South. | South-west. | West. | North-west. | Calm. |
|---|---|---|---|---|---|---|---|---|---|
| Cedar Keys . . . . . | 97 | 105 | 100 | 65 | 107 | 68 | 183 | 135 | 19 |
| Jacksonville . . . . | 95 | 179 | 58 | 105 | 151 | 111 | 66 | 71 | 83 |
| Jupiter . . . . . . | 66 | 109 | 111 | 269 | 122 | 68 | 62 | 95 | 17 |
| Key West . . . . . | 109 | 102 | 277 | 186 | 65 | 41 | 25 | 45 | 62 |
| Pensacola . . . . . | 139 | 164 | 77 | 130 | 76 | 149 | 78 | 90 | 16 |
| Titusville . . . . . | 78 | 90 | 105 | 215 | 62 | 114 | 102 | 125 | 28 |

*Average number of clear, fair, cloudy, and rainy days at Signal Service stations in Florida, from the commencement of observations to December, 1887, inclusive.*

| | January. | | | | February. | | | | March. | | | | April. | | | | May. | | | | June. | | | | July. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Clear. | Fair. | Cloudy. | Rainy. | Clear. | Fair. | Cloudy. | Rainy. | Clear. | Fair. | Cloudy. | Rainy. | Clear. | Fair. | Cloudy. | Rainy. | Clear. | Fair. | Cloudy. | Rainy. | Clear. | Fair. | Cloudy. | Rainy. | Clear. | Fair. | Cloudy. | Rainy. |
| Cedar Keys . . . . . | 9.8 | 14.1 | 7.1 | 9.9 | 14.5 | 9.1 | 4.6 | 5.9 | 12.4 | 13.1 | 3.5 | 7.8 | 15.1 | 10.5 | 4.4 | 6.1 | 12.5 | 13.5 | 5.0 | 6.8 | 5.9 | 17.9 | 6.2 | 11.5 | 8.4 | 14.9 | 7.7 | 14.2 |
| Jacksonville . . . . . | 8.6 | 12.7 | 9.7 | 9.4 | 10.4 | 10.2 | 7.6 | 8.9 | 12.1 | 13.0 | 5.9 | 7.8 | 12.7 | 11.5 | 5.8 | 7.2 | 11.0 | 14.4 | 5.6 | 9.4 | 7.6 | 15.2 | 7.2 | 13.3 | 9.1 | 16.4 | 5.5 | 14.1 |
| Key West . . . . . . | 11.3 | 14.3 | 5.4 | 8.4 | 11.9 | 12.7 | 3.6 | 7.1 | 15.9 | 12.3 | 2.8 | 4.9 | 13.8 | 13.5 | 2.7 | 5.1 | 9.3 | 16.9 | 4.8 | 9.1 | 5.8 | 17.9 | 6.3 | 11.6 | 5.4 | 19.9 | 5.7 | 14.3 |
| Pensacola . . . . . . | 6.8 | 14.0 | 10.2 | 13.5 | 9.9 | 10.8 | 7.5 | 9.6 | 12.5 | 10.6 | 7.9 | 9.4 | 11.4 | 12.6 | 6.0 | 8.0 | 11.5 | 13.6 | 5.9 | 7.0 | 10.8 | 13.7 | 5.5 | 13.0 | 8.5 | 17.6 | 4.9 | 15.5 |
| Sanford . . . . . . . | 9.5 | 10.7 | 10.8 | 10.5 | 12.2 | 11.0 | 5.0 | 8.0 | 12.8 | 11.7 | 6.5 | 11.2 | 14.4 | 11.8 | 3.8 | 8.0 | 11.0 | 16.4 | 3.6 | 11.0 | 6.6 | 18.0 | 5.4 | 19.2 | — | — | — | — |
| Titusville . . . . . . | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.0 | 13.0 | 4.0 | 14.0 |

| | August. | | | | September. | | | | October. | | | | November. | | | | December. | | | | Annual. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Clear. | Fair. | Cloudy. | Rainy. | Clear. | Fair. | Cloudy. | Rainy. | Clear. | Fair. | Cloudy. | Rainy. | Clear. | Fair. | Cloudy. | Rainy. | Clear. | Fair. | Cloudy. | Rainy. | Clear. | Fair. | Cloudy. | Rainy. |
| Cedar Keys . . . . . | 9.9 | 14.9 | 6.2 | 12.5 | 12.9 | 13.5 | 3.6 | 5.6 | 16.9 | 9.1 | 5.0 | 7.1 | 14.6 | 10.8 | 4.6 | 5.8 | 12.4 | 12.4 | 6.2 | 8.3 | 144.1 | 153.4 | 66.8 | 103.8 |
| Jacksonville . . . . . | 9.2 | 16.6 | 5.2 | 14.2 | 9.2 | 12.6 | 8.2 | 13.8 | 11.7 | 11.4 | 7.9 | 9.8 | 10.8 | 10.9 | 8.3 | 7.8 | 10.2 | 12.8 | 8.5 | 7.5 | 122.9 | 156.9 | 85.4 | 123.2 |
| Key West . . . . . . | 4.6 | 21.1 | 5.3 | 14.8 | 3.8 | 19.8 | 6.4 | 16.6 | 7.6 | 16.2 | 7.3 | 13.0 | 9.9 | 14.5 | 5.6 | 8.2 | 10.4 | 15.8 | 4.8 | 7.9 | 110.0 | 194.9 | 60.1 | 120.8 |
| Pensacola . . . . . . | 9.8 | 15.6 | 5.6 | 13.0 | 12.2 | 12.4 | 5.4 | 9.5 | 14.4 | 10.1 | 6.5 | 6.5 | 11.6 | 10.6 | 7.8 | 8.7 | 9.1 | 11.2 | 9.7 | 10.8 | 128.1 | 152.5 | 84.5 | 124.1 |
| Sanford . . . . . . . | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Titusville . . . . . . | 19.0 | 11.0 | 1.0 | 11.0 | 12.0 | 10.0 | 8.0 | 18.0 | 7.0 | 13.0 | 11.0 | 13.0 | 9.0 | 19.0 | 2.0 | 11.0 | 6.0 | 16.0 | 9.0 | 13.0 | — | — | — | — |

In 1855, Surg.-Gen. Th. Lawson, U. S. Army, said of the climate of Florida:—

"Florida, washed on the east side by the Atlantic, and on the west and southwest by the waters of the Gulf; daily fanned by the breezes from the sea, which are wafted over the whole face of the country, and with an atmosphere of equable temperature through winter and through summer, its climate cannot be more unfriendly to the health of man than that of the adjacent States, which present but one side or a small portion of their territory to the ocean. Florida may have more lakes on its surface, a few more rivers and rivulets, and a greater extent of swamp, perhaps, than the other States; but the exhalations from these sources are evidently modified and mollified by the universally pervading sea atmosphere, and must consequently be less destructive to human life than malaria, which is eliminated by the swamps and bottom lands of Louisiana, Alabama, Georgia, and South Carolina, or by the banks of the water-courses even of other more northern sections of country.

"I have served in Florida, and participated with the troops in the privations and the toils of the field; and I have served also with an army on the northern frontier, and from my experience of the influence of climate and of active operations in the field upon the health of soldiers, I have no hesitation in expressing the belief that had the troops who were employed in the Florida War been engaged for the same length of time in active operations in winter and summer on the frontiers of Canada, though the *cases* of *indisposition* might have been less numerous, the *mortality* would have been infinitely greater than was experienced in Florida. The general healthfulness of many parts of Florida, particularly on its coasts, is proverbial. The average annual mortality of the whole peninsula, derived from returns in this office, is found to be 2.6 per cent., while of the other portions of the United States (previous to the war with Mexico) it is 3.5 per cent."

The various sanitary reports of the medical officers serving with the troops in Florida during the Indian wars make special reference to the equable climate and fair healthfulness of the State; and Surgeon Southgate says:—

"While it is my opinion that Florida is probably the most healthy of the Southern States, yet I think it is a weak enthusiasm to conclude that Florida is the healthiest country on the face of the wide world. It would be strange, indeed, if her fertile swamps and hummocks did not generate fevers. It has been proved, however, that on her salubrious seacoast almost immunity from fevers may be enjoyed; and it is high praise to say that, if the bane exists, a way of escape is within easy reach of those who select Florida for a home."

As already said, there has been a great decline of malarial fevers in Florida since the close of the civil war, and within the experience and observation of the writer; and as the country settles up, and drainage with other sanitary improvements increase apace, it is not expecting too much to see in time an almost total exemption of the State from malarial fevers.

Within the last twenty years Florida has become the great winter resort for thousands who wish to escape the rigors of a colder climate. Many suffering with pulmonary diseases seek health in her mild and genial air. Of these latter some are benefited, while others are not, the degree of improvement depending much on the stage, progress, and acuteness of the pulmonary trouble. Even those who are not specially benefited in a curative sense are often benefited for a short time and life rendered a little more enjoyable by their being able to get out into the open air, and by thus escaping the irksomeness of confinement at their homes. The development of consumption is more dependent on the hereditary vice of constitution—the inherited predisposition to the disease—than on climatic conditions; and, therefore, it is the height of folly to place much confidence in the climatic cure of consumption. As a prophylactic in those inheriting the predisposition to the disease, or in its incipient stage—one hardly recognizable with certainty—a residence in Florida may be of benefit; but even in both classes of these kinds of cases, the writer has seen the disease develop and run a rapid course to a fatal termination.

Keeping in mind, however, the aphorism, as old as Hippocrates, that "a sick person should always leave the place where taken sick," it might still be found helpful for the consumptive to seek a change of climate. But the profession, as well as the public, should understand that there is nothing specific in the air of a southern climate to cure consumption, and that the benefit derived is purely hygienic in enabling the patient to enjoy the open air in out-door exercise, by which it is hoped that the nutrition may be improved, and the vice of constitution resulting in deposition of tubercle in the pulmonary tissue may be eliminated. Of course, where the patient is already suffering with hectic fever, and the destructive processes in the lungs are pursuing a rapid course, open-air exercise is probably out of the question, and little, if any, benefit may be expected. In fact, it would be preferable for such patients to remain at home with its comforts and the solace of relatives and friends than subject themselves to the discomforts of travel and hotel life, in the vain hope of being cured. When the disease, however, is of slow progress and of a rather chronic character, with little, if any, febrile disturbance, much benefit may be found by spending the winter in Florida, and living mostly in the open air; in short, resorting to camp life in favorable weather. In such cases marked improvement is generally the rule; but, of course, there are exceptions to all rules.

To the vast majority of the valetudinarian class from other causes than consumption, the winter's sojourn in the mild marine climate of Florida will always be found a powerful adjunct in re-establishing the impaired health.

Probably no State in the Union is provided with a greater number of fine tourists' hotels than Florida. Of these may specially be mentioned the Ponce de Leon, at St. Augustine, and the Tampa Bay Hotel, at Tampa, as surpassing in elegance, convenience, and comfort all others.

# TUBERCULOSIS AS A LOCAL AND CONTAGIOUS DISEASE IN NEW HAVEN.

By LOUIS S. DE FOREST, A.M., M.D.,

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More than one-seventh of the human race die from tuberculosis. Dr. Salmon, estimating from census returns, placed the deaths from this cause in the United States for the year 1880 at 150,000.

Were such a number to die from any acute disease in one year, it would create a state of panic; but the stealthy, gradual progress of tuberculosis tends to prevent a true appreciation of the deadly role it ever plays in nearly every community. The attitude of the world on the subject has generally been one of resigned indifference.

The government of Italy at one time offered an exception to this rule. In 1782 tuberculosis had become so prevalent and virulent in the kingdom of Naples that a series of laws, intended for the restriction of the disease, were enacted.

The principal features were: 1. The compulsory notification by the attending physician of all cases coming under his care; 2. The destruction, after death, of the patient's personal apparel; and 3. The complete renovation of the dwelling. Ill-aimed and unscientific as were these laws, they wrought a great change. Dr. Lawrence F. Flick, who has studied this subject with great care, in considering the condition in Italy before the enactment of these regulations as compared with the present, writes: "It will not be overstepping the mark to place the mortality-rate from tuberculosis for the kingdom of Naples and Italy in 1782 at 10 per 1000 living. In 1887 the mortality-rate from all tubercular affections for all Italy was 1.29 per living 1000. Expressed in figures, the reduction in mortality from tuberculosis in Italy since 1782 ranges from 50 to 90 per cent."

The great loss and trouble incident to carrying out these laws led to their gradual abandonment and final repeal in 1860.

Although, during the seventeenth and eighteenth centuries, probably from 33 to 50 per cent. of the deaths in England were due to tuberculosis, English authorities were especially active in combating the theory of infection. The statistics of the Brompton Hospital for consumptives, by which it was shown that phthisis was exceedingly rare amongst the attending nurses and physicians, were very effectively used for this purpose. The favorite English theory was that of heredity.

The theory that consumption was contagious has never lacked advocates. But the indispensable, the connecting link was until very recent years lacking. When, at last, in 1882 Koch announced and demonstrated that the bacillus tuberculosis was the ever-present, ever-active agent, it became possible to join theory and fact.

First, it was shown, by the investigations of Koch, Tappeiner, Bollinger, Grancher and Cadeac, Malet and Naegeli, that the mere breath of tubercular patients did not contain the bacillus and consequently was not infectious. Secondly, experiments of Koch showed beyond all doubt that inhalations of vapor charged with cultures of the bacillus (23 cultures extending over fifteen months) were highly infectious. Still further, Cornet proved that the dried sputum of phthisical patients contained bacilli in large numbers, and that inhalations or inoculations of animals with the bacilli or with the cultures obtained from this source were highly infectious. And lastly, Schill and Fisher were able to obtain results with sputum which had been in a dried state for ninety-five days. De Toma, also, found that sputum, which had been kept dry at an average temperature of 77°, was infectious after nine months. And Gebhard asserts that sputum, diluted to the proportion of 1 : 100,000, is still virulent.

We shall not need to relate the many experiments and researches made in this field, but may accept as fairly proven the fact that the dried sputum is in a very large majority of cases the conveyor of the infection. And, further, that this infection generally takes place through the lungs.

Naturally, the gain of the theory of infection has been the loss of the theory of heredity. The latter still has, however, many able advocates, and considerable statistical information has been collected bearing upon this point. Williams, in 1011 cases at the Brompton Hospital, found that heredity (parents only) gave 24 per cent. Polluck's 1200 cases (including parents, brothers and sisters) furnished 30 per cent.; Colton's (same relatives) 36.7 per cent.; and Fuller's 85 cases (including grandparents) also gave 59 per cent. These statistics are more or less vitiated by the fact that undoubtedly a large majority of the patients were brought up in an atmosphere infected by their parents.

As an offset to the Brompton Hospital observations concerning nurses, Cornet has brought forward the following: The vital statistics of the religious orders in Germany for the care of the sick show that out of a total number of 2099 deaths there were 1320, or 62.80 per cent. from tuberculosis. While for the whole German nation the tubercular death-rate for the ages from 15 to 20 was only 18.64 for each 10,000 living, for the nurses it was 116.96.

Among the nurses the proportion of deaths from tuberculosis up to the age of fifty years was 73 per cent. To eliminate a very serious element of error, which greatly vitiates the Brompton statistics, only those orders were taken whose term of service was for life.

Stick has also brought forward the following fact, bearing strongly against heredity. He shows that in the Nuremberg Orphan Asylum there had been but one death from tuberculosis in eight years; and that in the Munich Asylum, among 361 children, more than one-half of whom had lost father or mother, or both, from tuberculosis, there had been in twelve years but one case of that disease.

It has been pointed out by several writers that the fact that nearly all cases of so-called hereditary consumption are cases of tuberculosis of the lungs, instead of such organs as the liver or spleen, is very strongly against the theory of heredity.

It might be well, as our statistics deal with tuberculosis in a city, briefly to mention and illustrate the principal hygienic conditions favoring the development of the disease under such circumstances; for large cities are in general unhealthy. Thus, Donaldson stated the rate to be in Amsterdam 171 deaths to 100 births; in Berlin 131 to 100; and in London 124.92 to 100.

Insufficient or impure air stands first among conditions favoring the development of phthisis. Prof. Wilson states that the quantity of oxygen is always sensibly diminished in large cities, even in the open street. Donaldson estimates the tubercular death-rate to be at least 25 per cent. more than in the country districts. Dr. Richards writes that two out of three of the patients at his hospital for consumptives had led an indoor life. Of 3214 cases at the Brompton Hospital more than one-half had had indoor occupations. Baer states that, while the tubercular mortality in the whole world is about 15 per cent., in prisons it ranges from 40 to 50 per cent. In Germany, in a poorly-ventilated prison, the rate was 51.4 per 1000 living; while in a well-ventilated prison it was only 7.9 per 1000.

In 1858 the air in the Foot Guards' barracks was only in the proportion of 331 cubic feet per man, and the tubercular death-rate was 15.8 per thousand living. On the other hand, the Horse Guards, with 572 cubic feet per man, had a rate of 7.3 per 1000. Proper ventilation soon reduced the Foot Guards' mortality.

In 1856 Bowdin pointed out that, while the tubercular death-rate among the Guards was 12.5 per 1000 men, in the navy, from 1830 to 1856, it was only 1.76 per 1000. According to Wilson, the registration returns show that the deaths from tuberculosis, as compared with the deaths from all other causes, for the mercantile marine is ten times less than for the English land-population. If only the deaths between sixteen and forty-five are considered, the rate is sixteen times less. In the United States Navy for ten years the percentage of deaths from tuberculosis to deaths from all causes was 5.87.

Even a constrained and unvarying position has a deleterious effect. A series of statistics gives tailors out of each 100 deaths 39.9 of tubercular origin; and Dr. Guy found that those compositors who were compelled to retain a cramped position during work had 74 per cent. tubercular deaths, while among those whose work required the exercise of the whole body the rate was only 31 per cent.

Statistics have shown that those operatives living at some distance from their factory, that is, those who were compelled to take even a certain, small amount of out-door exercise daily, were less subject to consumption than those living close by.

Impure air comes to our notice generally in the form of air contaminated with dust, either metallic or vegetable. Many trades offer but a very short lease of life. So, for instance, the average duration of life for dry-grinders of forks is twenty-one years; for razor-grinders thirty-one years; for edge-tool grinders thirty-two. Among workers in copper and brass tuberculosis is the predominant cause of death, lithographers losing nearly 50 per cent. M. de Neufville's statistics give locksmiths and blacksmiths 30.9 per cent., painters 32.9, and shoemakers 38.9 per cent.; and it has been stated that three-fifths of the flax-workers in Belfast were consumptive. Grinders' phthisis was formerly considered as non-tubercular in nature. Opinion is, however, no longer unanimous on this point, and such an authority as Fagge asserted its tubercular nature.

It will be noticed that all these trades result in what Koch has declared to be one of the necessary conditions for infection—that is, an abrasion of the mucous membranes. These artisans, with the many small wounds of the bronchial membrane, with a vitality lowered by insufficiently pure air day and night, are constantly in a state favorable to infection. Moreover, facts are accumulating to show that very many of the tenement houses are capable of furnishing this infection.

Another hygienic condition favorable to the development of phthisis is dampness. Dr. Bowditch was the first to call attention to this. His theory is strengthened by such facts as the following: After a system of draining had been introduced, Salisbury's tubercular death-rate fell 49 per cent., Ely's 47 per cent., Rugby's 43, and Banbury's 41 per cent. In 1881, in two contiguous health districts of Ontario, one of which is a plateau free from malaria, and the other a flat malarial district, the deaths from tuberculosis were in the former 8.5 per cent. of all deaths, and in the latter 12.7 per cent.

Cornet, in his investigations, repeatedly demonstrated the presence of the bacillus in dust taken from the rooms or the surroundings of tubercular patients. Flick, accepting this theory of infected dwellings, applied himself to the task of demonstrating it topographically. His map of the tubercular deaths for twenty-five years in the Fifth Ward of Philadelphia brings out the point very clearly.

When the writer began the study of this subject in New Haven, he had not had his attention called to Flick's pamphlet. Had such been the case, the plan of this work would probably have been somewhat altered.

In studying this question in New Haven we have no district equalling in antiquity and density of population Philadelphia's Fifth Ward. Nor are our vital statistics available for this purpose for so long a period as twenty-five years. Until this year, indeed, no separate topographical record of tubercular deaths was kept.

Unfortunately, owing to various errors in filling out and copying, the death returns cannot be used previous to 1876. For the fifteen years, 1876-91, however, they are fairly available. The renumbering of streets, the tearing down of buildings, and mistakes in the certificates have unavoidably introduced some errors; but the attempt was made, with the aid of maps and directories, to reduce these to a minimum.

In all there were copied out from the registers 3000 tubercular deaths. Of this number 381 were not available for our purpose. A part of these were cases occurring in public institutions, of whose former residence no record had been kept; some were deaths in public institutions of persons from the surrounding towns, and were intentionally omitted; and, finally, a part occurred outside the limits of our map (Westville and the annex). In quite a number of cases, moreover, no address had been entered in the register.

The remaining 2609 deaths were divided among the various forms of tuberculosis, as follows:—

| | |
|---|---|
| Phthisis pulmonum and hæmoptysis | 2401 |
| Tubercular meningitis | 95 |
| Tubercular peritonitis | 4 |
| Hydrocephalus | 61 |
| Scrofula | 44 |
| Hip-joint disease | 4 |

These 2609 cases are represented, placed as accurately as the circumstances would allow, upon the main map. (See Map I.)

It will be seen that there are three principal districts of centralization. First, in the southeastern part of the city, in the neighborhood of East, Wallace, Hamilton, and Franklin streets (Irish and Irish-American population); second, in the western part, in the neighborhood of lower Oak Street and Congress Avenue (Irish and Irish-American population); and third, in the northern part, in the region of Eaton and Webster streets (negro population). These two latter regions are somewhat loosely connected by a line of infection running along Day and Orchard streets.

The deaths on this main map were distributed as follows: Three hundred and ten houses had 2 cases each; 70 had 3; 28 had 4; 2 had 5; and, finally, 3 had respectively each 6, 7, and 9. The remaining houses had only one case each. That is, very nearly 16 per cent. had more than one case. This is not a very high per centage, but it will undoubtedly increase with years. It will be seen that generally the houses are not isolated; that is, the infected houses adjoin or are in close proximity to each other.

The First Ward will be seen to be comparatively free. Nevertheless, it has a density of population per acre as a whole of 30; while the Ninth, containing Eaton and Webster streets, has only 6 per acre; and the Third, containing lower Oak and Congress Avenue, has 23 per acre.

The second map (Map II.) is an enlarged reproduction of the southeastern district. While the various sources of error mentioned before have probably prevented absolute accuracy, the deaths have been placed with considerable care. The 514 cases in this district (excluding the north side of State and the west side of Franklin) occurred in 361 houses. They were distributed as follows: Seventy houses had 2 cases each; 24 had 3; 12 had 4; 1 had 6; and 1 had 9. That is, about 27 per cent. had more than 1 case. There are about 650 houses in the district. Therefore, accepting the theory of infection, only about 54 per cent. of the houses would be capable of furnishing the germ of infection. If this supposition were true, we should expect to find the annual tubercular death-rate, in spite of new houses and the increased population, fairly constant.

For the fifteen years it was as follows:—

| 1876. | '77. | '78. | '79. | '80. | '81. | '82. | '83. | '84. | '85. | '86. | '87. | '88. | '89. | '90. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | 34 | 30 | 39 | 32 | 37 | 33 | 31 | 21 | 42 | 26 | 35 | 47 | 32 | 36 |

It will be seen that with only four exceptions the rate has been between 30 and 40.

The fact that this region now contains a large number of Italians will undoubtedly in a few years increase the number of cases of phthisis; for these people, coming from an out-door life in the Italian climate to an in-door life in our New England climate and living crowded together in small rooms, are especially liable to infection. As yet the local tubercular death-rate among them has been low. This is due to the fact that when their lungs become affected they almost invariably return to Italy. The disease is, however, undoubtedly on the increase among them. So far as the personal experience of the writer goes, both in private and dispensary practice, tuberculosis in the case of Italians tends to run an unusually rapid course; hæmoptysis seems to be an especially frequent and fatal complication.

In reviewing our statistics it was noticeable that the number of deaths from tubercular meningitis was unnaturally small. The fact that very young children would be especially liable to house infection emphasized this. It naturally suggested the supposition that many such cases had been returned simply as "meningitis." Accordingly, all the cases returned as meningitis up to and inclusive of five years of age for the fifteen years, 1876-90, were copied out and investigated in respect to infected houses. Of the 300 deaths 97 or $32\frac{1}{3}$ per cent. were found to have occurred in infected houses. Some cases were found where the death of the child was accredited to simple "meningitis," when the mother had died a few hours or days previously of "tuberculosis." In order to obtain some idea of the relation of this matter of infected houses to the ambulant cases of phthisis in the poorer classes, the 100 successive cases of phthisis previously to May 24, 1891, were taken from the books of the medical clinic of the City Dispensary and investigated in regard to this point. Of the 100 cases 52 were, at the time of entry, living in infected houses.

Unfortunately the death returns are not sufficiently complete to allow any deductions bearing on heredity.

On the point of nationality more may be elicited. Before, however, considering that subject, it may be well to point out one fact in Table No. 1 which would seem to favor the view of infection. It will be noticed that the first division under Class I., A (those born in this country of parents born in Ireland), have their highest death-rate, as is usual in tuberculosis, between the ages of twenty and thirty-five, and that after thirty-five the rate diminishes very rapidly. On the other hand, the second division, B (those born in Ireland), have a very low death-rate proportionally before thirty-five, and, what is not usual in tuberculosis in this or their native country, a high rate after the age of thirty-five. This was formerly ascribed entirely to the change of climate; and this factor has undoubtedly some little weight; but were it the predominant cause it would be equally noticeable in all nationalities. It will be seen, however, that the Irish, of whom a greater proportion than of any other nationality persistently live in the infected district, differ in this respect from the Germans and English, who are much more scattered throughout the city.

In the rural districts, both in Ireland and here, the Irish consumptive death-rate is not high. In the tenement districts of manufacturing cities, both in Ireland and here, the rate is very high. Climate and heredity will not explain this. Insufficient, impure air and infected houses will.

TABLE I.—*Phthisis (tuberculosis) and hæmoptysis.*

| | Under 1. | | 1. | | 2. | | 3. | | 4. | | 5. | | 5–10. | | 10–15. | | 15–20. | | 20–25. | | 25–30. | | 30–35. | | 35–40. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| CLASS I. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Born in U. S. A. of parents born in Ireland | 15 | 7 | 4 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 0 | 3 | 2 | 4 | 3 | 14 | 37 | 38 | 60 | 57 | 50 | 50 | 35 | 31 | 17 | 15 |
| B. Born in Ireland | — | — | — | — | — | — | — | — | — | — | — | — | 0 | 1 | 2 | 1 | 4 | 10 | 19 | 19 | 30 | 45 | 39 | 36 | 34 | 52 |
| CLASS II. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Born in U. S. A. of parents born in U. S. A. | 9 | 9 | 3 | 1 | 7 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 7 | 11 | 22 | 34 | 22 | 30 | 39 | 26 | 31 | 20 | 21 |
| CLASS III. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Born in U. S. A. of parents of unknown nationality | 2 | 2 | 3 | 3 | 0 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 3 | 2 | 1 | 1 | 5 | 25 | 17 | 23 | 8 | 16 | 4 | 12 | 7 | 8 |
| CLASS IV. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Born in U. S. A. of parents born in Germany | 4 | 4 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 7 | 8 | 5 | 10 | 4 | 9 | 3 | 2 | 3 |
| B. Born in Germany | — | — | — | — | — | — | — | — | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 1 | 1 | 4 | 7 | 4 | 8 | 2 | 7 | 6 |
| CLASS V. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Born in U. S. A. of parents born in England | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 5 | 4 | 5 | 2 | 1 | 0 | 4 |
| B. Born in England | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0 | 1 | 0 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |
| CLASS VI. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Born in U. S. A. of parents born in Scotland | — | — | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 1 | 3 | 0 | 1 | 0 |
| B. Born in Scotland | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0 | 1 | 2 | 0 | 1 | 1 | 1 | 1 |
| CLASS VII. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Born in U. S. A. of parents born in Italy | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| B. Born in Italy | — | — | — | — | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 2 | 0 | 0 | 1 | 0 | 1 |
| CLASS VIII. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Born in U. S. A. of parents born in Sweden | — | — | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | — | — | — | — |
| B. Born in Sweden | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0 | 1 | 3 | 2 | 1 | 1 | 0 | 0 |
| CLASS IX. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Born in various countries: in the majority the father and mother being of different nationalities | 4 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 2 | 7 | 8 | 5 | 8 | 11 | 12 | 4 | 3 | 10 | 5 |
| CLASS X. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Negro | 1 | 2 | 3 | 6 | 3 | 5 | 2 | 2 | 1 | 2 | 1 | 1 | 0 | 4 | 3 | 9 | 13 | 8 | 6 | 12 | 9 | 11 | 9 | 7 | 7 | 9 |
| Unknown sex or age | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sex totals at ages | 38 | 26 | 15 | 13 | 14 | 9 | 4 | 6 | 4 | 4 | 3 | 6 | 6 | 12 | 14 | 42 | 82 | 124 | 156 | 163 | 170 | 190 | 143 | 131 | 108 | 126 |
| Totals | 64 | | 28 | | 23 | | 10 | | 8 | | 9 | | 18 | | 56 | | 206 | | 319 | | 360 | | 274 | | 234 | |

TABLE I.—*Phthisis (tuberculosis) and hæmoptysis.*—Continued.

| | 40–45. | | 45–50. | | 50–55. | | 55–60. | | 60–65. | | 65–70. | | 70–75. | | 75–80. | | 80–85. | | 85–90. | | Un-known. | | Sex totals. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | | | M. | F. | |
| CLASS I. | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Born in U. S. A. of parents born in Ireland | 2 | 6 | 4 | 3 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | — | — | — | — | — | — | 1 | — | 235 | 235 | 470 |
| B. Born in Ireland | 37 | 42 | 31 | 33 | 35 | 19 | 30 | 11 | 19 | 13 | 18 | 9 | 8 | 11 | 2 | 4 | 1 | 1 | — | — | — | — | 309 | 307 | 616 |
| CLASS II. | | | | | | | | | | | | | | | | | | | | | | | | | |
| Born in U. S. A. of parents born in U. S. A. | 24 | 16 | 22 | 16 | 18 | 11 | 8 | 6 | 5 | 12 | 14 | 8 | 7 | 13 | 1 | 5 | 4 | 8 | 0 | 1 | — | — | 246 | 259 | 495 |
| CLASS III. | | | | | | | | | | | | | | | | | | | | | | | | | |
| Born in U. S. A. of parents of unknown nationality | 3 | 2 | 5 | 9 | 2 | 1 | 4 | 3 | 1 | 4 | 3 | 2 | 3 | 1 | 2 | 1 | 0 | 1 | 1 | 0 | — | — | 76 | 120 | 196 |
| CLASS IV. | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Born in U. S. A. of parents born in Germany | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 42 | 32 | 74 |
| B. Born in Germany | 7 | 4 | 4 | 4 | 7 | 3 | 6 | 2 | 4 | 2 | 3 | 1 | — | — | — | — | — | — | — | — | — | — | 57 | 35 | 92 |
| CLASS V. | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Born in U. S. A. of parents born in England | 1 | 2 | 0 | 0 | 0 | 1 | 1 | 2 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 12 | 23 | 35 |
| B. Born in England | 6 | 1 | 4 | 4 | 1 | 0 | 2 | 1 | 2 | 2 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | — | — | — | — | 25 | 21 | 46 |
| CLASS VI. | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Born in U. S. A. of parents born in Scotland | 2 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | — | — | — | — | — | — | 9 | 9 | 18 |
| B. Born in Scotland | 1 | 0 | 0 | 0 | 2 | 0 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 7 | 3 | 10 |
| CLASS VII. | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Born in U. S. A. of parents born in Italy | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1 | 2 | 3 |
| B. Born in Italy | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | — | — | — | — | — | — | 10 | 7 | 17 |
| CLASS VIII. | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Born in U. S. A. of parents born in Sweden | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2 | 0 | 2 |
| B. Born in Sweden | 1 | 1 | 1 | 2 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6 | 7 | 13 |
| CLASS IX. | | | | | | | | | | | | | | | | | | | | | | | | | |
| Born in various countries: in the majority the father and mother being of different nationalities | 6 | 7 | 4 | 1 | 2 | 1 | 0 | 4 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | — | — | 2 | 5 | 62 | 59 | 121 |
| CLASS X. | | | | | | | | | | | | | | | | | | | | | | | | | |
| Negro | 3 | 7 | 2 | 7 | 7 | 9 | 2 | 3 | 2 | 1 | 0 | 3 | 2 | 2 | 0 | 2 | 0 | 1 | — | — | — | — | 76 | 113 | 189 |
| Unknown sex or age | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 4 | — | — | — | 4 |
| Sex totals at ages | 95 | 89 | 79 | 79 | 75 | 48 | 55 | 33 | 36 | 35 | 41 | 24 | 21 | 31 | 5 | 14 | 6 | 12 | 1 | 1 | 7 | 5 | 2401 | | |
| Totals | 184 | | 158 | | 123 | | 88 | | 71 | | 65 | | 52 | | 19 | | 18 | | 2 | | 12 | | | | |

Single, 1083; Married, 1100; Widowed, 223; Unknown, 45; Total, 2401.

## TABLE II.

*Tubercular meningitis.*

| | |
|---|---|
| Under 1 year | 25 deaths. |
| 1 year | 29 " |
| 2 years | 10 " |
| 3 " | 4 " |
| 4 " | 8 " |
| 5 " | 4 " |
| 6 " | 4 " |
| 7 " | 4 " |
| 8 " | 2 " |
| 10 " | 2 " |
| 11 " | 1 " |
| 47 " | 1 " |
| 25 " | 1 " |
| | 95 |
| Male | 53 |
| Female | 42 |
| White | 91 |
| Negro | 4 |

*Tubes mesenterica.*

| | |
|---|---|
| Under 1 year | 9 deaths. |
| 2 years | 2 " |
| 8 " | 1 " |
| 32 " | 1 " |
| 48 " | 1 " |
| 54 " | 2 " |
| 63 " | 1 " |
| | 20 |
| Male | 11 |
| Female | 9 |
| White | 19 |
| Negro | 1 |

*Tubercular peritonitis.*

| | |
|---|---|
| Under 1 year | 1 death. |
| 8 years | 1 " |
| 14 " | 1 " |
| 30 " | 1 " |
| | 4 |
| Male | 1 |
| Female | 4 |
| White | 3 |
| Negro | 1 |

*Hydrocephalus.*

| | |
|---|---|
| Under 1 year | 41 deaths. |
| 1 year | 10 " |
| 2 years | 4 " |
| 3 " | 1 " |
| 4 " | 3 " |
| 5 " | 1 " |
| 7 " | 1 " |
| | 61 |
| Male | 38 |
| Female | 23 |
| White | 60 |
| Negro | 1 |

*Scrofula.*

| | |
|---|---|
| Under 1 year | 13 deaths. |
| 1 year | 3 " |
| 2 years | 3 " |
| 3 " | 3 " |
| 4 " | 1 " |
| 7 " | 1 " |
| 8 " | 1 " |
| 12 " | 2 " |
| 15 " | 1 " |
| 20 " | 2 " |
| 21 " | 1 " |
| 23 " | 1 " |
| 31 " | 2 " |
| 47 " | 1 " |
| 49 " | 1 " |
| 63 " | 1 " |
| 69 " | 1 " |
| 72 " | 1 " |
| 73 " | 1 " |
| 75 " | 1 " |
| 81 " | 1 " |
| Unknown | 2 " |
| | 44 |
| Male | 20 |
| Female | 24 |
| White | 40 |
| Negro | 4 |

*Hip-joint disease.*

| | |
|---|---|
| 8 years | 1 death. |
| 10 " | 1 " |
| 20 " | 1 " |
| 41 " | 1 " |
| | 4 |
| Male | 3 |
| Female | 1 |
| White | 3 |
| Negro | 1 |

From Table I. it will be seen that the 2401 deaths from tuberculosis and hæmoptysis are divided among the different nationalities as follows:—

| | | | |
|---|---|---|---|
| Irish parentage | 470 | or $19\frac{13}{24}$ | per cent. |
| Irish | 616 | " $25\frac{15}{24}$ | " |
| Native born of native parents | 495 | " $20\frac{14}{24}$ | " |
| German parentage | 74 | " $3\frac{4}{24}$ | " |
| German | 92 | " $3\frac{22}{24}$ | " |
| English parentage | 35 | " $1\frac{10}{24}$ | " |
| English | 46 | " $1\frac{21}{24}$ | " |
| Negro | 189 | " $7\frac{20}{24}$ | " |
| Other nationalities, combinations of nationalities, and unknown cases | 84 | " $15\frac{22}{24}$ | " |
| | | 100 | |

As far as these figures go, it will be seen that, contrary to the general belief, it is not the Irish-Americans who have the highest death-rate, but the Irish born.

Condensing the table brings out the nationality-rates more clearly :—

| | | |
|---|---|---|
| Irish and Irish parentage . . . . | $45\frac{3}{24}$ | per cent. |
| Native of native parents . . . . | $20\frac{14}{24}$ | " |
| German and German parentage . . . | $7\frac{3}{24}$ | " |
| English and English parentage . . . | $3\frac{7}{24}$ | " |
| Negro . . . . . . . . | $7\frac{20}{24}$ | " |

Unfortunately, the nationality statistics of the 1890 census are not yet available, and we have been obliged to estimate the present population by comparing the census of 1870 with that of 1880. In the census of 1880 the rule is drawn from a series of proportions: that for every 1000 born in Ireland and living in this country there are, approximately, 2414 persons in this country having Irish parents; for every 1000 German born, 2394 having German parents; and for every 1000 English born, 2082 having English parents.

Estimating by these proportions and by comparing the census of 1870 with that of 1880 we get the following results :—

| | Population, 1880. | Population, 1890. (Estimated.) | Average number of tubercular deaths for the 15 years (1876–90.) | Number of deaths per living 1000 on average population. | |
|---|---|---|---|---|---|
| Total . . . | 62,882 | 81,800[1] | | | |
| Irish . . . | 9,630 | 9,674 | 41.0 | 4.2 | 5.5 |
| Irish parentage . | 23,112 | 23,218 | 31.4 | 1.3 | |
| German . . | 2,802 | 3,370 | 6.2 | 2.0 | 2.7 |
| German parentage | 6,715 | 8,068 | 5.0 | 0.7 | |
| English . . | 1,358 | 1,764 | 3.0 | 1.9 | 2.7 |
| English parentage | 2,827 | 3,672 | 2.4 | 0.8 | |
| Native . . | 12,880 | 16,000 | 33.0 | 2.3 | 2.3 |
| Negro . . | 2,192 | 2,895 | 12.6 | 4.9 | 4.9 |

The Irish and Irish parentage will be seen to outrank all others in its tubercular death-rate; more than the negro and more than double the native.

New Haven (Connecticut having as a State one of the highest

[1] To correspond with the range of the map, this population is estimated only for the city proper, *i. e.*, exclusive of Westville and the annex.

tubercular death-rates) naturally has a high tubercular negro death-rate. Throughout the whole country, however, the negro rate is very little higher than the native white. The proportion of deaths among the negroes under twenty years is, however, noticeably large.

The death-rate for those of Irish parentage is very much lower than for the Irish-born. Thus, from our proportions, were the death-rate equal, for every 100 deaths of Irish-born we should expect about 240 deaths of Irish parentage. But, as far as our figures go, we only get about 125 deaths. The rate for the Irish parentage, in spite of the high Irish rate, is less than for the native class. It would be difficult to explain this by the theory of heredity.

Change of climate, especially from a somewhat warm to a somewhat cold one, undoubtedly is more or less favorable to the development of consumption. Thus, the native-born negroes in this country, as a whole, have only a little higher death-rate than the whites; but negroes born in Africa and transported to foreign countries die in great numbers from tuberculosis. For instance, at Gibraltar, for a period of nineteen to twenty years, the white tubercular death-rate per 1000 men was 6.1; the negro 33.5. At Ceylon the English white troops had a rate per 1000 men of 4.1; the negro troops of 10.5.

Flick, in his pamphlet, "The Contagiousness of Phthisis," points out the various points of similarity between tuberculosis and other contagious diseases. The grouping, the preference for certain localities, the progress about these localities in search of favorable material, the movement from house to house, are in both practically the same. The writer regrets that he has not had sufficient time to prepare a map of the Pneumonia cases for the fifteen years in question, for he feels very sure that such a map would offer a telling contrast to the city map of Tuberculosis.

Flick found in his ward-map for twenty-five years that 33 per cent. of the houses had had more than one case. In our smaller map for fifteen years the per cent. was found to be 27. This will undoubtedly increase.

How long a house remains capable of infecting its tenants we cannot tell from these statistics; for these deal only with deaths. People may have become infected, and then have moved elsewhere, leaving, however, a supply of fresh infectious matter behind them.

The usual rate of progress may be illustrated by a few cases: Double house No. 1, side A, deaths, April '79, May '79, May '83, April '88, June '89, February '89; side B, August 83, May '85, January '87. Double house No. 2, side A, July '76, August '80, May '89; side B, October '79, May '85, April '89.

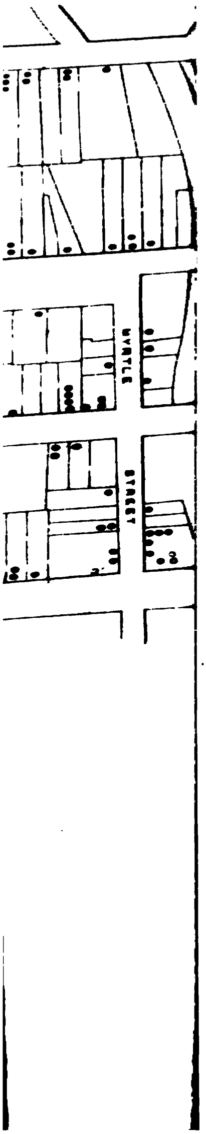
Sometimes a death from tuberculosis will be followed by a succession of deaths from "meningitis."

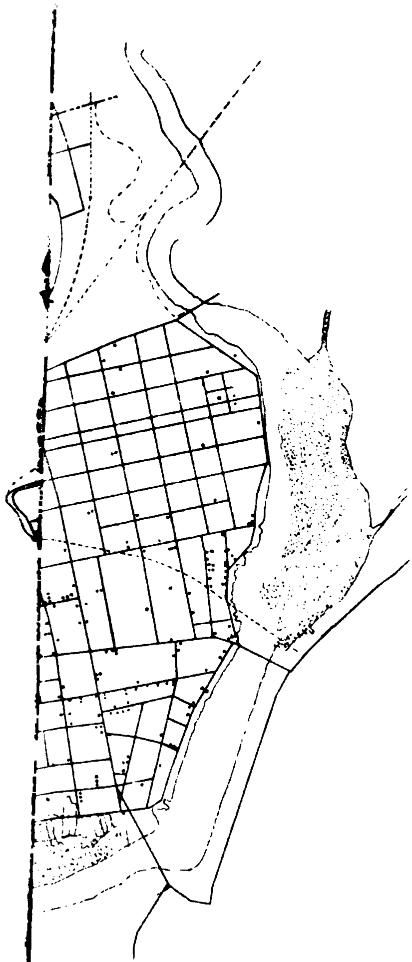
We think that the accompanying maps and tables fairly prove that consumption is endemic in certain parts of the city; that in these parts there are many houses in which it is distinctly dangerous to live. This danger is one which may be in a great measure overcome. It has been proved, beyond doubt, that the danger ceases when the air is not allowed to become contaminated with the dried sputum. This may be accomplished by the patients expectorating into vessels filled with water, care being taken afterwards to destroy the contents.

The poorer class of people may be much helped in their struggle with this foe by the passage of laws compelling a certain amount of ventilation in all dwelling-houses.

MAY 31, 1891.

NOTE.—These statistics must necessarily vary considerably from those of the local health department. In the health statistics, the returns for the whole city and town are included; also the deaths in public institutions and (until late years) the deaths from the condition known as "marasmus."


MYRTLE
STREET



**DEATHS FROM**
**UBERCULAR DISEASES**
**1876—90.**

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# A JOINT INQUIRY AS TO WHAT KIND OF PATIENTS SHOULD BE SENT TO THE FRENCH RIVIERA.

By STANLEY M. RENDALL, M.D.,
OF MENTONE.
AND
THOMAS LINN, M.D.,
OF NICE.

WITHOUT entering at present into the vast question of climatology, or making a special plea for our stations in the *Midi*, which would doubtless be superfluous in the case of so well a known region as the French Riviera that competent observers, such as the late Dr. Henry Bennet and Dr. Sparks, have so often written about. Also, without questioning the advantages of other places, nor even mentioning the newer facts lately shown of the geological questions that enter into the therapeutical indications of health resorts, we think it may not be out of place in your journal if we give, from our experience, an answer to the question raised in the title of this article, which is a practical one that will occur to many physicians or may be put to them by their patients going abroad.

Notwithstanding the discovery of various bacilli made daily, and even though it may be that the microbian theory of the etiology of many diseases is the correct one, it is well known that the mere mechanical effect of cold by its action in contracting the bloodvessels just beneath the skin and driving the blood to deeper organs must create a congestion elsewhere, most likely in our patients *locus minoris resistentiæ*, and this weak spot cannot recover promptly from the congestion thus produced, and disease follows. Cold, *per se*, is then an important factor. Next to this it will be admitted that that climate where patients can pass the most of their time in the open air at all seasons of the year, above all in winter, is the best for them. We claim for the French Riviera that it is a good climatic tonic, dry, marine winter resort, where a fog is never seen.

No matter what the weather is on land or sea, the air is constantly dry, bracing, stimulating, and invigorating. But to hasten on to the question as to what patients will be benefited by the climate of the south of France we should say, first, *pulmonary complaints.*

It is a humiliating fact for the drug-treatment of phthisis that the best authors to-day write mostly of its preventive or prophylactic therapeutics. The congresses held in late years in France to study tuberculosis have had much to say of the destruction of animals afflicted with the disease, and the interdiction of the sale of their meat and milk. It is true the question of the proper disposal of the sputum of tubercular patients was touched upon, and water-spittoons preferred to dry ones; and it is hoped that something is in view by Prof. Lannelongue's treatment for local manifestations of this malady. But the practical outcome of all recent study is that the climatic question is the most important of all in the therapeutics of phthisis. Dr. H. Weber says: "When the climate will allow of it, life in the open air is the best medication for phthisis." When, however, we come to the question of the forms of this disease that are most suitable for the climate in the south of France, we meet with some difficulties.

*Phthisis.*—Taken in its earliest stages, when the physical signs are limited to the extreme apex on one or both sides, and a mere alteration of the character of the breath-sounds, with harsh expiration accompanied with a marked impairment of the general health, phthisis does almost invariably well, one season being often sufficient to obtain a cure. Secondly, phthisis in the next stage, where the lesions are still localized at the apex, softening having commenced, but remaining limited in area, not tending to spread either by simple extension or by secondary foci forming in its neighborhood; and even phthisis in its third stage, when the cavities are small, and the line of demarcation between the diseased and sound areas is well marked, will meet with the best results here. Phthisis in all its stages, when accompanied with marked catarrhal conditions of the bronchial tract, with moist râles and profuse expectoration, also does well. The climate of the Riviera is one of the best by which to treat *predisposition* to phthisis, above all, the profuse nasal and other catarrhs that tend to this disease.

It has been asserted that in hemorrhagic cases a residence on the Riviera is contraindicated, but Dr. Rendall is of opinion that this is not so. It is probable that sur-alimentation and the general use of iron in such cases, as well as the constipation resulting, have much to do with this idea; but, if the bowels are kept acting regularly while the patient is put on a modified use of tonics, it is probable that the South, with its sunny atmosphere and outdoor life, as well as the fact that cicatrization will proceed faster in this dry air with its hæmatic power, will do much good in well-selected cases which are under proper treatment.

*Bronchitis and Other Respiratory Diseases.*—This large class of patients and those who have suffered from the influenza are the next who derive benefit from this climate. Not only are their sufferings relieved by a winter here, but we constantly see cases of bronchitis, of the subacute or chronic form, especially in the aged and when accompanied by profuse expectoration, who never passed a winter in the North without an attack, do so on the Riviera. In "winter cough," which so often tends to the insidious commencement of chronic incurable disease of the lungs, a winter in the South is of the utmost benefit, but a warning must be given here to insist on these patients remaining over the spring months, and not as they often do, once rid of the troublesome cough, returning to the cold spring of the North or of Italy, with a resultant return of the complaint, much to their own or their medical advisers' discomfiture.

*Asthma* of cardiac or bronchial nature does well here; but, where there is a large initial nervous element, it requires study of each individual case. As usual in this curious complaint, a place must be found where they are comfortable. It is said that there is a suitable climate for every asthmatic. Some do well by the sea; but an inland, high place, like Cirniez, on the mountains behind Nice, offers the best chance of success.

Next, four important classes of patients certainly do well on the Riviera. 1. All weak and feeble patients. 2. The aged. 3. The prematurely aged. 4. The overworked and overstrained business man.

The first class derive benefit from the fact that their temperature is kept up and a reaction created by the stimulating tonic air. As to the second and third, when people are really old or are, in fact, so from an original faulty constitution, or have weakened a good one by bad habits (work, alcohol, etc.), they get a longer lease of life by passing the winter in the South. Besides the fact that warmth is life and cold is death to them, there is a curious exciting element in the air of the Riviera that stimulates all the organs to better performance of their functions. Writers say they compose better here, and some well-known authors have written their best works on this coast. It is fair to state that this very exciting element will produce insomnia in certain nervous patients when they live too close to the sea.

The next important class of patients who get benefited in the south of France is composed of those suffering from the diseases peculiar to women. All the poorly menstruating patients do well here, as well as the painful uterine cases, dysmenorrhœa, etc. It is a well-known fact that women menstruate better here than in the North; parturition even has been stated to be accomplished by less pain in the same person here than when the labor took place in London or New York. Be this as it may, all women's complaints, unless there is a tendency to flooding, improve here.

*Anœmia.* Striking results are obtained very often here when these cases have resisted all forms of treatment in a less sunny climate. The excess of light has a wonderfully curative action in addition to the invigorating and stimulating air. It is essential, of course, to administer at the same time some form of iron, such as the protochloride, and to insist on an outdoor life.

*Hypochondria and Melancholia, etc.* The same conditions of brightness make the climate of the Riviera most suitable in these cases. Dr. Linn adds that life in the gay city of Nice, where such patients are cheered up by the world, has its advantages.

*Dyspepsia and Stomach Diseases.* The dry tonic sea air acts on the digestive organs, so that every one gets an appetite and all are able to assimilate food better here than in the North.

*Rheumatism, Gout, Sciatica, Paralysis* are all ameliorated constantly in the South. *Kidney Diseases, Diabetes,* as well as *Skin Diseases,* all do well. Where the skin functions act so well during the winter, the work of the other organs is eased up and facilitated.

# WHOOPING-COUGH: ITS MANAGEMENT: ITS CLIMATIC TREATMENT.[1]

By J. H. MUSSER, M.D.,

ASSISTANT PROFESSOR OF CLINICAL MEDICINE, UNIVERSITY OF PENNSYLVANIA.

In the management of whooping-cough we do not embrace, with the degree and vigor paramount to the importance of the case, the conception of the infectious nature of the disease. Such conception should be the fundamental basis upon which our therapeutics should rest. It is true, such means are employed to limit the spread of the disease and thereby prevent the infection of others. It is true, likewise, that such drugs are used as are supposed to limit or control bacillary inflammation. All this is well enough; but the writer holds that sufficient grasp of the fact that the disease is auto-infectious has not been taken, and that the cardinal principles that should obtain under these circumstances are largely held at naught.

Apart from the proof of bacteriological observations, one may see the auto-infection in the general and local phenomena. The constant recurrence from time to time of aggravations of the disease, in spite of measures to prevent "cold," etc., point to reinfection. Moreover, careful study of the inflammatory process in the lung cannot fail to impress one with the mycotic origin of the inflammation. This is particularly seen in the severe cases. An area of the bronchi is infected and the seat of inflammation. Its course is run, an area beyond infected, a decline of the process seen. And so this creeping mycotic inflammation extends from large to small, from small to smaller tubes, extending over a considerable period of time, until the soil liable to infection is exhausted or the patient succumbs to the disease.

With such conception of the nature of whooping-cough our

[1] Read by title before the American Climatological Association, Washington, D. C., Sept. 1891.

guidance in its management would be easy if we were certain as to the source of such infection. Does auto-infection take place from the tissues within the body, or does reinfection arise from extraneous conditions, such conditions being due to the affected individual? In other words, is the patient in constant danger of being reinfected from the discharges, such as the abundant expectoration, which have not been properly disposed of? That the former is more than possible, the laws of mycotic inflammation well support. That the latter is likewise possible all principles of infectious diseases uphold. Clinical observations and the results of management conducted in accordance with such ideas confirm the truth that reinfection is the cause of the grave and protracted or relapsing cases of whooping-cough.

In the personal experience of the writer the following occurred:—

A little child, twenty months old, had a severe attack of the disease. Extra measures to remove discharges and insure cleanliness were used. She was removed to the sea-shore. She improved and was brought to her home. She grew worse soon after her return, and in spite of removal a second time to the sea-shore she died. The writer is thoroughly convinced that the return of the patient to the room previously occupied was the cause of her reinfection and ultimate death. Other examples could be cited, and doubtless, to many practitioners, a similar experience has fallen. If it is true that the gravity of whooping-cough is increased tenfold by auto-infection, such measures as may prevent the auto-infection are essential in its successful management. The writer will not again discuss that which has been thrashed out so often, viz., the use of antiseptics introduced through the stomach or by inhalation. While their value may be questioned, this is certain, that change to an aseptic atmosphere, which is stimulating to the general system, is a vantage-point secured far beyond the use of drugs.

The following truths will occur to any one: In the management of whooping-cough it is absolutely essential to apply the principles which are laid down in the control of all infectious diseases. It is not necessary to discuss in detail such common knowledge. In general it may be said, to prevent the infection of others, quarantine should be insisted upon. The younger members particularly of the family should be protected. All discharges should be disposed of in accordance with antiseptic regulations; all personal clothing and bed-linen should be treated accordingly. The patient's body should be disinfected by baths, etc., daily. The attendants should be disinfected likewise. The room should be furnished as we are wont to do in cases of scarlatina. If possible, frequent changes to another room should be made, the room just occupied being thoroughly disinfected in the interim. No doubt the value of the treatment by sulphur fumigation of the sleeping-rooms, as advised by many writers, arises because of the disinfection secured. Other measures will occur to the practitioner. The above simply points the way; the details of antiseptic management must be carried on in all cases.

*The Climatic Treatment.*—In a few words the climatic treatment was alluded to above. All agree that cases which develop in our cities are benefited by change. Removal to the sea-shore or the country is generally followed by an amelioration of all symptoms. It is not necessary to discuss the benefit of such treatment. We all recognize its utility. It is of vital importance to discuss its practical possibilities. All recognize the difficulties that arise. Hotels refuse patients with the disease; private houses take them only on the fullest recompense. A certain class are debarred from climatic treatment by the expense attending it. Any one who has tried to get patients to suitable places will appreciate the difficulties and discomforts to himself and his patients. It is with the hope that the members of this society can now, or in the future, suggest and have established systematic means by which, to most persons, climatic treatment may be possible, and can be secured with a certain amount of comfort at a reasonable degree of cost, that the writer has ventured to bring up this homely but practical topic.

Is it worth while for this society to appoint a committee which might investigate the question involved and attempt to devise means whereby the benefits of climatic change could be secured to most of our patients?

Could a central bureau of registration or a directory be devised which at once could furnish all desirable information concerning health resorts and their accommodations for infectious diseases?

This bureau need not be general. Each community might have one for resorts in its vicinity as each large town has a nurse's directory. Could and should this society attempt to get the authorities of properly selected points to build or encourage the building of sanitariums for the treatment of whooping-cough?

With a full appreciation of the practical importance of the subject, the writer submits the above for consideration.

# MEDICAL TREATMENT OF PLEURISY.[1]

By G. M. GARLAND, M.D.,

BOSTON.

In response to a request from our Chairman, I agreed to open the discussion upon pleurisy by a paper on the medical treatment of that disease. I have nothing new to advance upon this topic, nor do I know of any novelties of recent origin. It is often useful, however, simply to review our limitations in the hope that such definition may reveal further opportunities for advance.

The great and burning question of to-day is in regard to the tubercular affinities of serous pleuritic effusions. Are all such effusions tubercular in origin? Do attacks of pleurisy augur a greater liability to subsequent tuberculosis?

Both of these questions have been hotly contested during the last few years, but unfortunately no definite decision has yet been reached. Some effusions, upon test, have revealed a flotilla of tubercle germs; others have apparently contained no germs.

Landouzy reports a large percentage of cases in persons who have subsequently died of tuberculosis. Coriveaud has followed up twenty-seven cases of sero-fibrinous pleurisy for periods of twenty-five, twenty, sixteen, eleven, ten, and eight years, and none of them became tubercular. Bowditch's results favor Coriveaud's conclusions.

My own experience is probably exceptional, but 50 per cent. of the cases of sero-fibrinous pleurisy, seen by me in private practice and in consultation during the past fifteen years, are to-day dead or dying of tuberculosis. Eighty per cent. of these cases of subsequent tuberculosis required tapping before the effusion disappeared. None of them were old, neglected pleurisies, and all were tapped and relieved of the effusion within a reasonable time.

[1] Read by title before the American Climatological Society, Washington, September 22, 1891.

Some of them enjoyed apparently good health after the pleurisy and before the tubercular development which terminated their lives.

Since writing the above, I have seen the following statistics of Dr. Barrs, who thinks "that there is a close association between pleuritic effusions and tuberculous changes in the body. Of seventy-four cases of pleurisy with effusion, under treatment in hospital between the years 1880–84, thirty-two are dead, twenty-five are living, and seventeen could not be traced—that is, there had been a death-rate in the cases which could be traced of something like 57 per cent. In the thirty-two fatal cases the average age of the patients was thirty-two and a half years, the maximum being fifty-four and the minimum three. As to the duration of life after the onset of the disease, there died in hospital three; died the day after leaving hospital one. In the remaining twenty-eight cases the average duration of life was two and a half years, the maximum being five years and the minimum six months. The causes of death in the thirty-two cases were as follows:—

| | |
|---|---|
| Known phthisis | 14 |
| Probable phthisis | 1 |
| Hip-disease | 1 |
| Tubercular meningitis | 1 |
| Acute tuberculosis | 1 |
| 'Pleurisy' | 3 |
| 'Dropsy' | 2 |
| 'Hydropericardium' | 1 |
| Unascertained causes | 8 |
| Total | 32 |

"So that twenty-one cases out of thirty-two died of the disease 'pleurisy,' or some recognized tuberculous condition, mainly phthisis pulmonalis."

The therapeutic indications in the early stages of pleurisy are usually simple and sharply defined; cough, pain, and fever are the usual discomforts. To allay the cough, I have been best satisfied with small doses of morphine (gr. $\frac{1}{100}$–$\frac{1}{60}$) repeated every hour. It seems to me that such doses soothe the cough better and with less general disturbance than larger doses repeated at longer intervals. Such doses do not much affect the pleuritic pain, however, and for this I employ hot poultices made after Brunton's rule. Take a piece of old flannel and make a bag of required size with a sufficient flap on one side. Pour into it the poultice steaming from the fire, and stitch down the flap and apply. A poultice with a muslin face must first be cooled by waving in the air and blowing, but a flannel bag poultice can usually be applied immediately, and thus the full benefit of the heat obtained. So far as my experience goes, a poultice is of benefit only during the hot and painful stage of the inflammation of a serous membrane. Later, when an effusion has formed, and the question of absorption arises, poultices are useless and a burden, and the patients express themselves as conscious of this fact. I think the poultices and morphine, by allaying local and general irritability, tend somewhat to abate the febrile movement. As a rule, however, pleuritic fever does not fly high. I have never, therefore, considered antipyretics as indicated in this affection. Moreover, as antipyretics are all cardiac depressants, I think the patient is safer without them in a disease which is notoriously dangerous by its tendency to cardiac exhaustion. I sometimes employ gelsemium for headache and restlessness, and this is practically the limit of my medication of the early stage. As soon as an effusion forms, it becomes a poultice itself and pain usually ceases, though the cough may increase in frequency.

To relieve pain, Otto, of Dorpat, advises bandages around the entire thorax at the level of the pain. He prefers cotton to elastic bands. He commences in the axillary line of the sound side and passes two overlapping rows tightly around the chest. At first the patient experiences constriction, but in a few moments he accommodates himself to the pressure, and finds that he can breathe much more easily and even more deeply than before by reason of the cessation of the stitch. Otto says only one patient insisted on the removal of the bandage, but subsequent pain led him to beg for its replacement.

Drzewioski extols salicylic acid and salol in pleurisy, on the ground that this is a rheumatic affection, and he thinks that he has obtained very satisfactory results with these drugs.

When an effusion has fully formed, there arises the question of its disposal. Nature, when left to herself, exhibits two ways of inducing rapid removal of the fluid; by hyperhydrosis and purgation. Acting upon this hint, Dr. Hay, of Scotland, devised the so-called "dry treatment." Absorption is essentially an osmosis, and the conditions which favor that process in a glass vessel will likewise favor it in the human chest. If one can abstract water from the blood and thereby increase its density, he will also render its absorbing power greater. Hay's method consists simply in diminishing, as much as possible, the amount of fluids taken into the stomach, and increasing the amount of water in the evacuations. He recommends the free use of salts in the morning to induce watery stools, which, combined with limited drinks, soon puts the blood in a condition for absorbing. This method is not only good in theory, but it *works*. I have employed it in a number of cases with highly gratifying results. I shall cite one case which was, perhaps, the most striking:—

Mrs. L., 22 years old, was first seen by me on July 4th. She then had had a cough, fever, and a severe pain in her side for a few hours, but there was no sign of any effusion. On July 8th, I found evidences of fluid in the pleural cavity. This fluid accumulated until it reached the third intercostal space in front, where it attained its maximum. The fever and other symptoms gradually abated, but the effusion remained stationary until July 24th, when I began the dry treatment. On July 27th, I could no longer find any evidence of fluid in the chest.

In one way this treatment is difficult to carry out, because it involves no slight amount of discomfort to the patient. Such patients, weak and fretful from illness, are not always amenable to reason when harassed by a steadily increasing thirst. For this reason, I think it wise not to begin the thirst ordeal too early in the case. After the effusion has entirely formed, and the inflammation of the pleura has largely subsided, one can hope for good results with an intelligent patient who has the nerve and hopefulness to endure a few days' additional discomfort.

Instead of salts I have employed Seidlitz powders as more palatable, and the amount of saline given must, of course, be according to the individual requirements and strength of the patient.

As an exhibition of the power of hyperhydrosis to produce absorption, I cite the following case: In May, 1890, I had a patient in my care, suffering from ulcerative endocarditis. The disease focus was apparently situated somewhere in the right chambers of the heart, because the embolic explosions, which occurred about once a week, were limited to the pulmonary district. Among other disasters produced thereby was a large pleuritic effusion on the right side. It had lasted several days and reached as high as the fourth rib in front. The presence of the fluid was verified by Dr. David W. Cheever and myself, and we were deliberating upon the necessity for tapping, on account of impeded respiration. The effusion was then of full size on Wednesday. On Friday morning, when Dr. Cheever and I met in consultation, to tap if necessary, no fluid could be found in the chest. Meanwhile the man had sweat as I have never seen a person sweat before. Throughout his illness, sweating with and without chills had been a prominent feature, and at the period mentioned the sweating had been so excessive and constant, and the consequent changing of his bedclothing and shirts had become so burdensome to him, that we allowed him to lie naked in bed with loose blankets wrapped about him. Two able-bodied nurses and the patient's mother took turns by day and night in wiping his body and removing wet blankets. During one night, between 7 P. M. and 7 A. M., eighteen blankets were wrapped about him and then removed thoroughly wet, and this in addition to frequent and vigorous wipings with towels. I may add that this sweating, somewhat modified, kept up till death, and the patient lay wrapped in blankets, without shirts, for about six weeks.

As the result of this profuse sweating, an effusion reaching to the fourth rib was entirely absorbed in about forty-eight hours. At the time when this occurred, I saw the report of a similar case of ulcerative endocarditis, with profuse sweating and phenomenally rapid absorption of a pleuritic effusion, which occurred in the practice of Dr. A. L. Loomis, of New York, and was published by him.

In regard to tapping, I am not so radical as many writers. I am to-day addressing a body of skilful and experienced physicians, but I am discussing a topic of great importance to the novice, and therefore I say that I do not consider it safe or wise teaching to instruct young physicians to puncture every chest that contains signs of fluid after a few days' illness. Such advice I have seen given, but I have found no statistics which exhibit better results by such methods than are obtainable by more conservative treatment. Moreover, the reputation of a too ready resort to aggressive therapeutical measures is not an enviable one for a young practitioner. Again, it is not merely a pleuritic effusion which is the assailable point, but it is a living, sentient being with all his environment which must enter into the problem of treatment. I therefore maintain that mild measures should first be thoroughly tried and proved to be futile before paracentesis is decided upon in all cases of small or moderate effusions, and one should always wait until the flurry of the initial inflammation has subsided.

I say that I recommend conservative measures with small or moderate effusions, but beyond this there are two indications which should take precedence of everything else, and these are :—

1. An excessive amount of fluid in the chest.

2. Stress symptoms in breathing or in the action of the heart.

If an effusion extend above the third rib in front, I call it excessive and an indication for tapping. Should stress symptoms, such as difficult breathing, cyanosis, a lump in the throat, etc., be also present, then not a moment should be lost, as death may occur at any instant, and a physician who hesitates to tap under these circumstances is morally responsible for an unnecessary death should such issue unfortunately occur.

Now and then a case presents itself with conspicuous stress symptoms and only a *small* amount of effusion. In such cases one should proceed cautiously, because the stress is probably due to a coincident heart-disease rather than to the presence of the fluid, and, while tapping may benefit, the operation is not unattended by danger.

The following case impressed this fact upon me: In June, 1890, I one day found a man, 64 years of age, in my office, exhibiting great distress of breathing. He was noticeably cyanotic, and talked in short, jerky sentences. On examination I discovered a moderate effusion in the left side, not reaching above the fourth rib. Later in the day I tapped him as he lay half-reclining in bed. After removing about a quart of fluid, I noticed that the patient became excessively cyanotic and troubled for breath. I removed the needle and applied stimulants, but I thought the man would never rally. Finally he grew easier, but for several days he was unable to rise in bed without a modified attack of the same kind. After a few weeks he returned to his home in the West much improved in strength and wind, but with marked dulness on the affected side. In the following October his physicians at home deemed it advisable to tap him again. As they inserted the needle he dropped dead. The stress symptoms in this case were evidently due to other causes than the effusion, though undoubtedly aggravated thereby.

Another condition of pleurisy may occur. A patient comes with a moderate effusion of long standing. Ought one to tap immediately? Such cases are sometimes still amenable to less radical measures. I recently saw a man who had a moderate pleuritic effusion on the right side, combined with general anasarca from cardiac and renal troubles. The history of the case revealed the fact that the illness began last November with the pleurisy, some time before the general dropsy developed. I wanted to tap the chest, but yielded to the desire of the friends to try other measures first. I gave the infusion of digitalis and acetate of potash. The urine increased quickly from about thirty ounces to ninety and one hundred ounces per day, and the effusion absorbed so rapidly that a stitch recurred in the side as the inflamed surfaces began to creak over each other once more.

The causes of sudden death with large effusions are no doubt multiple. Weil concludes that such deaths may occur by thrombosis or embolism of heart or pulmonary artery; by œdema of the opposite lung; by degeneration of the myocardium. Such causes as syncope, displacement of the heart, torsion of the great vessels, and hypothetical lesions, like multiple cerebral embolism, may be provisionally accepted, but they require further investigation. Weil also states that sudden death occurs oftener in right than in left pleurisies, and that it may come without any premonitions.

Why the heart-muscle should be so prone to degenerate in pleurisy is an interesting topic, but one which I have never seen discussed. The phenomenon appears to rank with certain other trophic changes of pleurisy and its kindred affections. It is a recognized fact that an inflammation of any serous membrane is liable to produce atrophy of muscles in its immediate neighborhood. I have seen a gonorrhœal synovitis of both knee-joints produce such excessive atrophy of the thigh muscles that the patient could hardly lift his feet from the floor, and he was many weeks in regaining the power to walk without a cane. Pleurisy is said similarly to affect the muscles on the same side of the chest. Possibly a like trophic influence may be exerted upon the heart.

# THE CLIMATE OF SOUTHERN ARIZONA.

By JOHN TRAILL GREEN, A.M., M.D.,
TUCSON, ARIZONA.

THE climate of Southern Arizona, with Tucson as a centre, has been, as yet, but little described or discussed. That this region has attracted the attention of many leading lung and throat specialists in the East, is proved by the large number of their patients who are yearly sent to the territory. Until lately Arizona has been almost inaccessible to invalids, but the past few years have done away with the Apache and the desperado, and our country now offers accommodations that will suit the weakest. In fact, its chief charm as a health-resort is that it has not advanced far enough in civilization to have its cities polluted by the exhalations from all classes of diseased humanity, nor its dwellings and hotels poisoned by deadly germs.

Not only the cities, but the many ranches offer homes for the invalid that, from the manner of life alone, not to speak of the climate, would give health to many who annually die from a disease which exercise in pure dry air will cure.

It is not the intention at present to go into details in regard to special cases treated, nor to dwell upon the general clinical effects of the climate, but simply to describe in brief the climate itself. A year or so ago, the Commissioner of Immigration for Arizona requested the writer to furnish for his Report a few remarks on the climate. In this brief report four divisions of the subject were made, and the liberty is taken of enlarging on them for the present article.

They are :—

I. The humidity of the atmosphere.
II. The rarity of the atmosphere.
III. The temperature.
IV. Irritating elements that may be detrimental.

I. *The Humidity of the Atmosphere.*—Much is written about "dry" climates, but many writers and physicians forget upon what the dryness of a climate depends. Four phenomena of nature must be carefully considered:—

(*a*) The amount of rainfall.
(*b*) The amount of dew.
(*c*) The rapidity of evaporation.
(*d*) The porosity of the soil.

The United States Signal Service report of the rainfall at Tucson, Arizona, covering nearly twenty years, is as follows:—

**Latitude 32 deg. 14 min., longitude 110 deg. 52 min.; altitude 2390 feet.**

**Monthly Average.**

| Jan. | Feb. | Mar. | April. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| .71 | .85 | .69 | .26 | .07 | .08 | 2.90 | 2.74 | 1.21 | .34 | .49 | .99 |

**Yearly average, 11.46 inches.**

However, it must be remembered that rainfall alone is no criterion of climatic dryness. We must take into consideration evaporation and soil porosity.

A minimum rainfall in a climate in which there is but slight evaporation, or in a region in which there is almost no porosity of the soil, would make a climate far from "dry;" it would be decidedly damp. On the contrary, our evaporation is so rapid, and our soil porosity so great that in our rainy season, almost as soon as a storm ceases, our atmosphere regains its normal dry, clear state. Fogs are dispelled by the same elements, viz., rapid evaporation and unusual soil porosity. Hence, they are most unusual occurrences, and almost unknown.

It is the same with dew. Only in the latter part of our summer season, and, even then, after an exceptionally hard rainfall, is the slightest dew perceptible.

II. *The Rarity of the Atmosphere.*—Atmospheric rarity is, of course, most closely connected with altitude, but the nature of rare air is greatly misunderstood. It must never be forgotten that it is not always dry air; nor is it cold air. No better illustration of this can be found than in the Santa Catrina Mountains, north of Tucson. They rise ten thousand feet above sea level, and by rapidly ascending them, all symptoms of increasing atmospheric rarity can be felt on the slightest exertion. On their very summit the wild strawberries bloom profusely in the summer. In the winter the same spot is covered deeply with snow; and again, when the clouds hang low over the mountains, this same rare air, be it warm or cold, is saturated with moisture, and the tops of the mountains covered with a dense fog. This fog is infrequent, and lower down the mountain is prevented by soil porosity and evaporation, leaving the foot-hills as clear and dry as the valleys and mesas.

III. *The Temperature.*—In any hot "DRY" climate the most misleading thing is the thermometer.

This is because the effects of heat are so closely connected with humidity and rarity. A child can almost explain the difference between hot dry air and hot air loaded with moisture. The following is the Signal Service report, for the year 1889, of the climatic conditions at Tucson:—

| 1889. | Min. | Max. | Mean. | Rain. | Aver. monthly rain since 1876. |
|---|---|---|---|---|---|
| January . . . | 30° | 77° | 53.5° | 1.74 | .81 inch. |
| February . . . | 29 | 82 | 55.5 | 1.06 | .93 |
| March . . . | 44 | 81 | 62.5 | 1.98 | .98 |
| April . . . . | 43 | 95 | 69 | 0.18 | .18 |
| May . . . . | 48 | 96 | 72 | trace | .12 |
| June . . . . | 57 | 102 | 79.5 | 0.30 | .29 |
| July . . . . | 66 | 105 | 85.5 | 5.66 | 2.84 |
| August . . . | 74 | 104 | 89 | 2.06 | 2.36 |
| September . . . | 51 | 100 | 73.5 | 3.12 | 1.16 |
| October . . . | 42 | 95 | 68 | 0.36 | .64 |
| November . . . | 31.5 | 82 | 56 | 0.32 | .55 |
| December . . . | 30.7 | 76 | 55.1 | 1.59 | 1.29 |
| Average monthly . | 45.5 | 91 | 68.2 | | |
| Total . . . . . . . . . | | | | 18.35 | 12.15[1] |

It will be noticed that only during three months does the thermometer show anything like the startling figures that are attributed to Arizona, and it may safely be said that fully 20° F. can be subtracted from these figures by those whose feelings are accustomed to a damp climate. It is true there are a few who cannot stand even this heat on account of the effect on the stomach and its appendages, but most patients exaggerate it, and thus lose the most curative portion of the dry year. Even when the thermometer mounts so high the air is never sultry nor loses its bracing character.

[1] This table contains a few more rain-fall statistics.

IV. *Irritating Elements that may be Detrimental.*—Much is said against Southern Arizona on account of the heat of the summer months.

As a matter of fact, these three months are of the utmost benefit to catarrhal troubles of any nature, whether tuberculous or not.

As has just been said, there are some individual cases that cannot stand the effects of the heat on the stomach and its associate organs, but they are few, and the best results are obtained by an "all year round" residence. The writer reserves the discussion of cases and clinical effects for another article, but desires to emphasize the fact that the evil results of this dry heat are largely imaginary and much exaggerated.

A worse feature is the dust in the cities, and this, too, is exaggerated. In the cities of all dry climates, and, indeed, in all cities, there is necessarily much dust at times; but the so-called dangerous "dust-storms" and "whirlwinds" are novelties of the rarest type, and last but a few hours at most.

Away from the cities, in the foot-hills, and on the high mesas there is no dust at any time; and even in the cities a little care and caution is all that is necessary to avoid it.

Does a small amount of dust, for a few hours a week, during a short dry season, compare with morning and evening fogs or heavy dews of daily occurrence?

Another element often spoken of as harmful is the apparent difference in temperature between night and day.

This is, of course, only in the hot summer, and due to the intensity of the direct rays of the mid-day sun.

The natives of all hot countries, and so in Arizona, keep out of the sun in the middle of the day, but boldly sleep out-doors every night in a drier, more healing air than most health resorts ever offer by sunlight. Many Eastern cities excel us in dust phenomena and temperature changes, and add to the former the pollution and germs from thousands of diseased and dying human beings; and with temperature variations are daily associated dampness, fogs, dews, and frost that are unknown and unheard of here, excepting on the rarest occasions.

# BISKRA. AN IDEAL WINTER CLIMATE.

By J. MADISON TAYLOR, M.D.,
PHILADELPHIA.

THE search for an ideal winter climate will go on forever. It is striving after the unattainable, of course, and as this or that spot comes to enjoy the reputation of being the only suitable place where one may escape the rigors of northern latitudes, it will become overcrowded or unfashionable, and the chase will pass on. Among the most promising of these localities seems to be Biskra, in the province of Algiers, an oasis at the very north edge of the great desert of Sahara. Here the fashionable world, especially the French-speaking *monde* and those who follow in their wake, claim that they have found the most charming place wherein to spend the winter. They have already stimulated capitalists to build handsome, thoroughly equipped hotels there, and the tide of fashion is steadily setting that way. It may be briefly described as the terminus of the railroad running south from the great ports on the North African coast, the chiefs of which are Algiers and Philippeville. From either harbor railroad communication is to be had *via* Constantine to the very edge of the desert, Biskra. Here is the centre of the various caravan routes across the Sahara. Beyond this it would be exceedingly difficult to build railroads, because the conformation of the land is such that from this point which is just south of the Atlas Mountains, the drop to the level of the desert is extremely great. A solid wall of rock bounds the southern edge of the Atlas Mountains for hundreds of miles east and west. Against this the waves of sand beat as upon an unconquerable barrier. These sand-waves shift incessantly, too, and would make the construction or maintenance of a railroad a very doubtful undertaking. Nevertheless, such a project is under consideration even now, and may soon or late be realized. In any event Biskra bids fair to be for years the focal point of either railroads or caravan trails. It is, therefore, a seething mass of the more bustling forms of an eastern commercial centre. To one unfamiliar with the marvellous, indescribable charm of oriental scenes, this place offers limitless attractions. Also there was immediately about here centuries ago an enormous amount of Roman and other early civilization, the remains of which always attract the traveller. At Constantine, about midway betwixt this place and the coast, there are to be seen in excellent preservation the most magnificent ruins of any Roman colony, set in the most beautiful surroundings.

As to the climatic advantages of all this region, it need only be said that it is sufficiently high, being practically on the sides of the Atlas Mountains, to enjoy all the atmospheric charm of elevated table-land. Near by, on many sides, are snow-capped mountains throughout the bulk of the year. Southward the enormous expanse of sand absorbs and retains the heat of the tropical sun, over which almost no cloud passes throughout the entire year. In the immediate neighborhood of the mountains, however, local vapor condensations occur, and showers are numerous enough at certain times; but the characteristic of the climate is steady, uniform, dry warmth. The elevation of the place modifies this to just about the proper degree. There is, then, a practically uniform climate throughout the year. It is not only dry, but bracing, at no time cold, and only in midsummer unbearably hot, as the equatorial rays become completely vertical. The season is, therefore, a long one; the possibility of malaria almost *nil*, because of the intensely drying properties of the vast volume of sun-heated, sand-reflecting desert air. In the valleys there is a little verdure in some places, very charming to behold, the sight of which, seen here and there on looking down upon the desert oases, inexpressibly gladdens the eye. Among the charming possibilities of the place are visits on horseback to other oases lying near by. The general mode of life of the country is about that of the time of Moses—unspeakably picturesque. The quaint customs of the Arabs are to be admirably studied hereabout; the shepherd Arabs of the plain, the Nomads, or wandering tribes, commingle. Yet, again, other tribes with different characteristics dwell up along the sides of the Atlas Mountains, and from far distant countries other forms of life, Arab, Moor, and African, here collect. It is needless, however, to specify all the delights which would meet the eyes of those who might be bold enough to come this far, because no doubt there will soon be guide-books and prospectuses galore setting forth all these things. It is enough to mention to the readers of The Climatologist that in this region there are great possibilities, and particularly that these are not now so inaccessible. As a practical suggestion I may say that only within a month there has been established a special branch of the North-German Lloyd Steamship Line direct from New York to Genoa. One of their finest steamships, the Fulda, sails monthly from New York to Genoa direct, stopping only at Gibraltar for mails, and reaching its destination in eleven days. In about a fortnight she returns, making the round trip in about five weeks. From Genoa one may reach the North African ports in many and easy ways. There are steamship lines from thence direct to the French ports in Africa, or it is but a trifling journey by rail to Marseilles. From this point numberless ships of French and Italian lines run throughout the Mediterranean. The trip from Marseilles to Algiers direct is but twenty-six hours, in very comfortable boats. Indeed, the little railroad journey from Genoa to Marseilles is exceedingly attractive, as all the way one runs from point to point through that land of delight, the Mediterranean Riviera. Just one word about the Riviera in passing. The valetudinarian has gradually come to look askance at the Riviera since his daughters and sons have grown up. In the first place, the gambling-hells of Monte Carlo are answerable for an immense deal of moral obliquity in the rising generation. They always have been for the older generations; but what one may tolerate in himself looks vastly worse when his own children outdo him on the same evil lines; so that, as I say, the valetudinarian, or the frequenter of the Riviera, is looking about for a place which will not only be free from this baneful moral influence, the enormity of which is becoming realized, but also grave suspicion is cast upon Cannes and other of these heavenly-looking places in the matter of drainage, malaria, and all that insidious crew. To be sure, they say that the Casino privileges are not to be re-granted by the Duke of Monaco when they expire, but nothing about this is certainly known. Nothing can alter the fact that along this charming bit of shore there will be unnumbered delightful villas, and dwellers in them, until time grows very old; but inevitably there must arise new and promising regions where the jaded voluptuaries and dilettantis will search for rejuvenating atmospheres; and also those honestly indisposed who may not endure the rigors of northern winters will seek balmy and drier airs. Among all the places yet to be discovered there will be few which can offer more than this same oasis at the very northern edge of the great sandy waste of Africa.

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The EDITORS desire to acknowledge, with thanks, the receipt of publications from the Boards of Health of California, Connecticut, Michigan, and Mansfield, Ohio; as also other publications regarding Public Health from HENRY B. BAKER, M.D., and FRANCIS J. ALLEN, M.D. It is hoped that there will shortly be added to the JOURNAL a department devoted to statistical reports regarding the health of various parts of the country, meteorological conditions in so far as they relate to matters medical, and any other material bearing upon the questions of public health and vital statistics. For this reason it is desired that all such publications may be sent to the JOURNAL in order that as complete a summary as possible may be obtained. The EDITORS are confident that such a department would serve a useful purpose, and furnish to its readers information otherwise unobtainable.

# ABSTRACT FROM CURRENT LITERATURE.

*The* EDITORS *request that Reports of Papers read before Societies, Reprints of Articles, Letters from Physicians containing matters of General Interest pertaining to the Subjects in the Title-page of this Journal should be sent to the* EDITORIAL OFFICE, 913 WALNUT ST., PHILA., *marked for* CLIMATOLOGIST.

## BACTERIOLOGY.

**Tubercular Character of Hospital Dust.**—At the Convention of the Academia di Medicinia di Torino, Prof. Foà described his experiments undertaken with the object of ascertaining whether the phthisical contagion is liable to be stored up on the walls of the hospital. For this purpose he has scraped off a part of the wall on a level with the night-table, in one of the departments of the hospital at Turin—Ospedale di S. Luigi—where six phthisical patients were lying. The powder thus obtained was hypodermically injected into three guinea-pigs, of which one remained alive, one died in twenty-four hours from pyæmia, and the third, killed at the end of three weeks, was found to be affected with tuberculosis (of the spleen and lymphatic glands).

Although only a single case, the author thinks that it could not be one of natural self-developed tuberculosis, as among the 425 guinea-pigs experimented upon in his laboratory, not a single one was found to suffer from that disease; and, besides, the mother of the three guinea-pigs was found to be healthy, on the post-mortem examination.—*Times and Register*, August 29, 1891.

**The Preservation of Living Malarial Parasites.**—Rosenbach, having failed to obtain cultures of the malarial parasite on artificial culture-media, adopted the ingenious plan of applying leeches over the splenic area of malarial cases, allowing them to gorge themselves, then killing them in forty-eight hours, and examining the blood so obtained from them. He found that at the expiration of that time the blood contained the characteristic parasites, which seemed to have undergone some developmental changes.—*Berlin. Klin. Wochenschrift*, August 24, 1891.

**Disinfection by Carbolic Acid, Creolin, and Lysol.**—Drs. Remonchemps and Sugg have investigated the comparative values of the above substances for disinfecting purposes. For their purpose the authors employed the bacilli and spores of anthrax, of cholera, and of typhoid fever. All three of the agents acted but slowly upon free spores. Although practically the difference in the activity of creolin and lysol as compared to phenic acid amounted to but very little, the two former were more prompt than the latter in their action upon bouillon-cultures. Owing, however, to their different power, as toxic agents, it will be seen that their relative microbicidal activity differs to a considerable extent when compared with their toxic power. The amount of carbolic acid required to kill a known weight of rabbit was 8, that of creolin 11, and that of lysol 23 parts; showing that a given weight of carbolic acid might be less active as a parasiticide than the other two substances; but that more of the latter could be used without danger of a toxic effect upon the individual. A curious fact was developed in their researches, viz., when clothing was soiled by the fæcal discharges from cholera or typhoid fever patients, complete sterilization could be effected in two hours by any of the agents when acting in the cold, but that when warmed to a temperature of 122° F. the same result was obtained in a half-hour.

Lysol accomplished disinfection of the hands or instruments in five seconds when used warm in a strength of five per cent.; while in five minutes ulcers and cavities were disinfected by a solution of two and one-half per cent. strength.—*Sanitary Inspector*.

**New Method of rapidly detecting Tubercle Bacilli.**—Dr. Kronig has been able to find a considerable number of tubercle bacilli in a case where ordinery methods had failed to detect them, by means of the employment of centrifugal force, in addition to dilution with caustic soda, according to Biedert's method. The sputum was diluted with a caustic soda solution, and then subjected to the action of centrifugal force in a centrifuge for five minutes, at the end of which time a fairly compact sediment separated, in which numerous bacilli were discovered. This method is much more rapid than that of Biedert, where the sediment is obtained after standing for two or three days.—*Berlin. Klin. Wochensch.*

## DIET.

**Milk from a Hygienic Standpoint.**—At the meeting of the German Association of Public Hygiene at Leipzic, September 17–20, 1891, Prof. Soxhlet, of Munich, spoke as follows:—

In the first place, it is necessary to distinguish between the nutritive and the dietetic value of milk. The first is above all things dependent on the *feeding* of the cows. The more water the fodder contains, the greater the quantity of the milk will be; but at the same time it will be so much the thinner. In order to obtain a milk of uniform quality, the mixed milk from several cows is preferable to that of a single cow; likewise the time of milking should be regular. Hitherto the chief weight has been laid upon the adulteration of milk. The addition of water is only to be regarded as a diminution of its value; it is not injurious, especially for children, to whom only diluted milk is given in any case. On the contrary, the removal of the cream, and the mixing of skimmed with full milk constitute material (deterioration), for in this case an important constituent is lacking.

The dietetic value depends principally upon the degree of the contamination with dust, bad-smelling gases, particles of fodder, and especially dung; accordingly, the addition of anti-fermentative substances, at present not forbidden by the food laws, should be prohibited. Many of the substances mentioned are directly nauseating; others are rendered so by boiling.

An actual injury and a source of danger are constituted by the bacteria introduced with the dust and cow-dung. These convert valuable nutritive material of the milk into products of inferior value; excrete substances actually poisonous alter the composition of the milk, and under certain circumstances decompose it with strong evolution of gas. The method of obtaining milk makes it impossible to keep it absolutely pure; we must endeavor to obtain what is really capable of accomplishment. We protect ourselves against the dangers of contamination by treating the milk with the centrifugal machine, and against its tendency to decomposition by sterilizing it. It is true that in this latter process certain changes take place in the milk which are greater in proportion as higher temperatures are employed; on this account it is better to use a lower degree of heat for a longer time, rather than a high degree for a short time. In any case children and invalids should use sterilized milk exclusively. Where this comes too dear, charitable institutions would be in place. The additional cost of the employment of sterilized milk in the nourishment of infants for the first year has been computed to be about 45 marks. In order to supply the great cities with milk, the following precautions should be observed: The milk, immediately after milking, should be cooled down to 10°, and after 1-2 hours separated from the impurities which have settled in that time, and then transported in very clean vessels, packed in ice. It is not advisable to attempt to force adults to use sterilized milk. On the other hand, this latter should be used as soon after boiling as possible, as in this way all danger of infection is avoided. Milk that coagulates in boiling is to be considered as already sour.—*Deutsche Med. Woch.*, September 24, 1891.

**The Relative Value of Boiled and Unboiled Milk.**—The following conclusions were arrived at by M. Vasilieff, as a result of experiments upon six healthy young men: They were fed for three days upon boiled milk, and three days upon that which had not been so treated. He found that the nitrogenous elements in boiled milk were not so perfectly assimilated as were those in the unboiled article; fatty matters maintained the same relation in the two sets of feedings; the fæces, when unboiled milk was ingested, contained a greater amount of fatty acids than they did during the period when boiled milk was administered. The nutritive value of unboiled milk is, therefore, greater than that of the boiled article, due to the rapid conversion of casein in the boiled milk into hemi-albuminoid.—*Jour. de Médecine de Par.*, May, 1890.

## HYGIENE.

**Cure of Inebriety.**—In consequence of the remarkable success claimed by the Russian physicians, Portugalow-Sawara and Zergolski, in the treatment of drunkenness with hypodermic injections of strychnine, this method of treatment was tried in the city hospital in Görlitz, Silesia. Seven notorious drunkards were subjected to treatment, and nitrate of strychnine injected, commencing with daily doses of $\frac{1}{30}$ gr. which was increased to $\frac{1}{15}$

grain. The results were almost entirely negative. In two cases the *vomitus matutinus* was increased, but a repugnance to alcohol was not manifested in any case; on the contrary, after the completion of the treatment, during which no alcohol was taken, the *schnaps*, from which they had been deprived so long, was consumed by them all with the utmost satisfaction, and even a double allowance caused them no unpleasant symptoms. After leaving the hospital, they remained, as far as could be ascertained, as much addicted as before to drunkenness.—*Deutsche Med. Woch.*, September 24, 1891.

(As, in the Keeley treatment for drunkenness, strychnine is supposed by some to be the important constituent of the hypodermics, the above experiment will not fail to excite interest. Possibly the moral element was the part lacking in these cases, and accountable for the failure.—ED.)

**Artificial Atmospheres in the Treatment of Tuberculosis.**—PROF. G. SEE read a paper upon this subject before the Académie de Médecine, from which the following conclusions may be drawn:—

The treatment consists in the use of artificial atmospheres under pressure. In any stage of the disease the patient should remain for from three to six hours daily in an apparatus containing air compressed and saturated with the combined vapors of creasote and eucalyptus. Either of these agents (compressed air or creasote and eucalyptus), when used alone, is valueless; the creasote acting upon the pulmonary parenchyma over a large surface, when inhaled under pressure. Internally creasote can only be given for a few days or weeks without gastric derangement, whereas the value of the drug is only obtained by a thorough impregnation of the system. The use of creasote by hypodermic injection can also be used for but a short time. The least objectionable of all antiseptic materials is creasote; and living in an atmosphere impregnated by the drug can be readily supported for several months without evil consequences. Even when far advanced in the disease the appetite in all of the cases was improved, while undergoing this method of treatment. The good effect of this result is seen in the gain of strength and weight that occurs. The fever, also, is favorably influenced, being reduced in a majority of the cases to 37° in the morning, and 37.5° at night. Hæmoptysis is affected for the better, and is invariably relieved during the course of treatment. Dyspnœa disappears and the cough lessens; the sputum becomes less purulent, more nearly odorless, while bronchial secretion is diminished. Physical examination shows that the local disease remains, but the râles are entirely limited to the cavities, the bronchial râles having vanished. To sum up: The employment of an atmosphere under pressure and charged with creasote causes a complete arrest of the disease, if not a definite *cure*, all of the secretions are altered, and the general state becomes normal; the disease consisting merely of the local condition.—*Bulletin de l'Académie de Médecine.*

**Result of Improved Hygiene at St. Petersburgh.**—The municipal council of St. Petersburgh has built an immense filter by which all of the water supplied to the city is purified, have attended to the sanitary condition of the populous portion of the city, have furnished the poor with gratuitous medical attention, carefully provides for the analysis of food-stuffs and the study of their preparation, orders careful inspection of markets, restaurant-kitchens, etc., and in other ways looks after the welfare of the citizens of the capital. By these means the mortality of the city has been reduced 35.5 per cent. in ten years, it having fallen from 38.2 per thousand in 1881 to 27.2 in 1889.—*L' Union Médical.*

## LIFE INSURANCE.

**Alcohol and Longevity.**—The following facts are contributed by Bannister: In the *Dublin Medical Journal* for July, 1890, E. McDowell Cosgrove considers the statistics of the Friendly Societies in Great Britain in regard to the connection between intemperance and longevity.

The author compares the statistics of the expectation of life in the Rechabites, an order established in 1835, wherein are contained 37,802 individuals and 127,269 years of life, and the members of which are total abstainers, with the Foresters and Odd Fellows, who have taken no abstinence pledge.

The expectation of life in these three Societies is shown in the following table:—

| Years. | Odd Fellows. years. | Foresters. years. | Rechabites. years. |
|---|---|---|---|
| 20 | 41.3 | 40.2 | 45.1 |
| 30 | 34.0 | 32.9 | 37.3 |
| 40 | 26.7 | 25.8 | 29.1 |
| 50 | 19.9 | 19.1 | 21.2 |
| 60 | 13.6 | 13.2 | 14.2 |
| 70 | 8.5 | 8.3 | 8.5 |
| 80 | 5.0 | 4.9 | 4.9 |

As the higher decades in the left-hand column are reached, it is seen that the three columns to the right more and more nearly approach each other, making it appear that, as old age approaches, total abstinence has accruing to it less and less of advantage as to expected length of life. *Per contra*, during the decades from 20 to 30, and from 30 to 40 the greater expectation of life among the total abstainers amounts to between five and six years. That is to say, that 134 Odd Fellows, 118 Foresters, and 165 Rechabites (representing total abstinence) out of 1000 at twenty years of age may expect to attain to an extreme old age.

Another instance of the same fact is seen in the Society founded in 1840 by Warner, a Quaker. For the first seven years this society was composed of total abstainers, but at the end of that time a section of "moderate drinkers" was admitted, forming by the union of the two classes the "Temperance and General Provident Institution of Great Britain."

In the twenty-three years between 1866 and 1889 there were 3198 deaths in the temperance section as compared to an expectation-number of 4542; while among the moderate drinkers the numbers were 6645 against an expectation of 6894. It is thus seen that while the moderate drinkers fell 4 per cent. below the calculation, the deaths among the total abstainers fell 30 per cent. below the number anticipated.—*Review of Insanity and Nervous Diseases.*

**Beer-drinking in its Relation to Heart Disease.**—In Munich, where the average amount of beer annually consumed reaches 565 litres *per capita*, not only is heart-disease very prevalent, but the duration of life among those engaged in the brewing trade is much less than that attained by those not so engaged. This fact is shown by the average duration of life among the general population (53.5 years), those who keep ale-houses (51.35 years), and the brewers (42.33 years).—*Blätter für klin. Hydrotherapie*, No. 4, 1891.

**Duration of Life.**—From *The Insurance Agent* we learn that a well-known German statistician has obtained the following statistics in regard to duration of life: The average is thirty-seven years. Before the seventeenth year a fourth of the population dies. But one person in a thousand attains the age of one hundred years; six in a thousand reach the age of sixty-five years; 35,214,000 persons die during each year; 96,480 each day; 4020 each hour; 67 every minute; while there are born 36,792,000 annually, 100,800 daily, 4200 hourly, and 70 in each minute. The average duration of life is greater in the married than the unmarried individuals, among civilized than among uncivilized communities; while tall people are longer-lived than those of shorter stature. The chances for life, as regards men and women, are more favorable for the latter before the age of fifty, for the former after that age. Married persons bear the proportion to single ones as seventy-five to a thousand. Those born in the spring are more robust than those born at other seasons of the year. More deaths and births occur during the night than during the day.—*The Sanitarian.*

## OCCUPATION.

**Life-Shortening Occupations.**—The *Medical Age* contains the following abstract from the *Journal of the American Medical Association*:—

One of the curious features of modern life is the extent to which the most hazardous trades are overrun by applicants for work. The electric light companies never find any difficulty in obtaining all the linemen they need, notwithstanding the fact that the dangers of that kind of business have been demonstrated times without number. The men who work in factories where wall-paper is made frequently joke one another over the tradition that a man's life, in this trade, is shortened ten years. A similar belief is prevalent in factories where leather papers are made, and among men who have to handle them, and whose lungs are said to become impeded by inhaling the dust arising from such papers. In certain other factories, where brass ornaments and fittings are made, the air is laden with very fine brazen particles, which are, when inhaled, especially irritating to the lungs. But one of the most singular advertised calls for employés that was ever printed appeared recently in a Connecticut newspaper, signed by a firm engaged in the business of building towers. It called for applicants only among those who are young, strong, and courageous, and closed by saying: "We warn all seekers for this job that it is of the most dangerous nature, and that few men continue in it more than a few years. In fact, it is almost certain death to the workman who follows this occupation."

# THE CLIMATOLOGIST.

## A MONTHLY JOURNAL OF MEDICINE.

VOL. I. DECEMBER 15, 1891. No. 5.

"INTRODUCTION.

"The object of this JOURNAL is to promote original investigation, to publish papers containing the observations and experience of physicians in this country and Europe on all matters relating to CLIMATOLOGY, MINERAL SPRINGS, DIET, PREVENTIVE MEDICINE, RACE, OCCUPATION, LIFE INSURANCE, AND SANITARY SCIENCE—and in that way to supply the means by which the general practitioner and the public at large will become better acquainted with the diseases of this country and Europe, and better armed to meet the requirements of their prevention or cure. The study of these subjects in this country is exciting great and increasing interest, and all admit that, from the little knowledge already possessed of its resources, possibly every known combination of atmospheric condition, soil, altitude, climate, or mineral springs, is to be found on this continent. It is confidently expected that *a journal devoted to the study of all diseases into which climate, soil, race, occupation, hereditation, diet, contagion, etc., enter more or less as factors*, will receive the encouragement of all, and become eventually an authority upon all subjects which are included in its title, although a thorough review of all progress in the departments mentioned will not be neglected. Especial attention will be given to the publication of *original material*, and it is to be hoped that physicians of all sections of the country will send papers upon any subjects which will be of general interest—such as the diseases of their locality—those incident to occupation, race, or climate, the study of epidemics, the questions of proper food, of the water supply, its potability and distribution, and all matters relating to drainage and diseases dependent on it.

"Original papers based upon experimental studies, or laboratory investigations in bacteriology, will form a prominent portion of the material presented during the year.

"Special attention will also be paid to the subject of health resorts, descriptions of Sanitariums with special reference to their suitability to certain cases, and the proper selection of patients to be benefited by different resorts. The utmost care will be taken that this JOURNAL shall assume and maintain the highest scientific character. It will be absolutely independent in its principles—*fair towards all*. It will depend for its maintenance upon the support given to it by the profession, as it is not published in the interest of any special section or clique."—*August*, 1891.

# NOTES ON GENERAL *versus* LOCAL TREATMENT OF CATARRHAL INFLAMMATIONS OF THE UPPER AIR-TRACT.[1]

By BEVERLEY ROBINSON, M.D.,
NEW YORK.

ONE of the constantly recurring topics of discussion between the general practitioner and the specialist is the relative importance of general and local treatment of catarrhal inflammations of the upper air-tract. This depends, no doubt, in great part, upon the differences in the field of their observation. Thus the general practitioner regards the body as a whole made up of very numerous parts. In the diseases of any particular organ he is prone to trace the relations which exist between them and sufferings elsewhere, and to remark that very frequently it is only in proportion as some, more or less remote, organ is favorably modified as to its structural or functional disturbance that the disease, for which advice is sought, is benefited or cured. True, the specialist will say that he makes similar researches to those of the general practitioner as far as he is able; and, when at fault, seeks other and, as he believes, helpful advice. But is it possible for him to do so in all cases, and even if he could, would his final judgment of what it is best to do for the patient be as good as if the latter had in the beginning the broader advice and treatment of a general physician? These and many other questions of a similar kind have been presented and answered, as we all know, in opposite manners from the time specialism first showed its real strength. In the relations which specialism bears to the treatment of inflammatory diseases of the upper air-tract, it is often difficult to determine to what extent her influence has been useful. At the present time if any one who is thoroughly conversant with general medicine raises his voice before an assembly

[1] Read before the American Climatological Association, September, 1891.

of throat and nose specialists in favor of many time-honored views, such as the importance of diathesis in the causation of these affections, their relations with errors of diet, habit, or mode of life; their dependence upon malaria, syphilis, or tuberculosis, it is scarcely too much to say that such views are often shown to be unpopular and antiquated by the manner in which they are received. A few, it may be, of those present are willing to acknowledge that there is more than a grain of truth in opinions thus expressed; but the majority shakes its head negatively and merely considers the writer, or teller of the story, as a benighted person of a past era.

The reverse of the picture is, however, also true and not seldom encountered. And here I mean those very conservative practitioners who still regard the knowledge acquired by the laryngologist and rhinologist as of very doubtful value, and who no more believe in the untold ills occasioned by hypertrophy of the turbinated bodies, or a deviation of the septum, than they do in anything else that to them is somewhat mythical. I believe, and I always have believed, that the true position is held, and only can be held by the general practitioner, who has sufficient special training to allow him to be fully appreciative of what is being done properly in that line, but who is in daily contact, also, with the multiform diseases of the human economy in almost every organ.

On the latter ground, which I regard as *terra firma*, figuratively, I have long stood. Each year, as it passes, more thoroughly convinces me of the soundness of my views.

To pass from these general remarks to the study of our subject, I would begin by asking, What does it profit a man's nose to be sawed, gouged, or trephined, because the pituitary membrane is inflamed? Does it improve more rapidly than if the old methods of inhaling, spraying, and douching were continued? To these queries, of course, no general answer can be given which does not, of necessity, carry with it numerous exceptions. After all, however, it is useful to point out certain rules of guidance which shall enable us to practise intelligently, and to do what is sensible with the various special cases as they arise.

I am of the opinion that in instances of marked obstructive disease of the nasal passages due to the presence of mucous polyps, or a bony or cartilaginous overgrowth of tissue, that freedom should be given to nasal respiration by means of suitable operative interference, provided always that the obstruction is wholly dependant upon one or other of these conditions. When, however, the obstruction is only of such a character as to be really objectionable when inflammatory disease of the mucous membrane of the nasal passages is, so to speak, grafted upon, or attached to it, the problem is not so easily solved. A large proportion of adult persons have more or less obstruction of one or the other nasal passages in a certain sense. I mean by this that one nasal passage is less free than the other.

This can be readily determined by those present in pressing gently upon one naris, and then breathing in and out through the other nasal passage. When they have tested one nasal passage in this manner, let them reverse the process by pressing on the other naris and drawing the air with each inspiration into the nasal passage, which was at first closed, with the finger. The statement which I have just made, and which has been repeated by me on several occasions, proves conclusively to my mind, that we must not expect all adults to breathe equally well through both nasal passages. Are such persons to be considered in an abnormal or unhealthy condition and requiring operative interference? My anwer is: If the obstruction be permanent, and evidently causes disease in adjacent organs, as the eye, ear, or larynx; or if the patient be visibly annoyed, or distressed by the existing condition, it should be removed. If, however, the obstruction be only occasionally objectionable, and at such times depends upon the swelling and engorgement of the pituitary membrane, then some suitable local applications are all that is required, unless the constitutional condition, or the condition of some organ be such that we find the indications for general treatment. If local applications alone be required, it is, of course, very important to make those that are beneficial. And here it is that the wisdom of the practitioner is essential. If the lining membrane of the nose be already acutely or chronically inflamed, we must not increase these conditions. It will not do, for example, to try warm inhalations, or warm sprays, upon an inflammatory condition of a few hours' standing, and afterwards allow the patient to go into the open air. Especially is this true, if there be any febrile movement in connection with the inflammatory process.

Again, whilst there is a small proportion of patients who obviously get a measure of relief, usually temporary, from the use of the nasal douche, yet this means of treatment has been shown to occasion additional obstruction of the nasal passages in very many cases. Not infrequently, even when certain precautionary measures have been adopted, the ears have become acutely inflamed, and gone on to suppuration, following its use. Applications in the form of spray of a soothing and protective coating like that of vaseline, or cosmoline oil (or the proprietary distillations called variously albolene, benzoïno, glymol, etc.) have a great advantage in that they do no harm, and often ameliorate the unpleasant symptoms from which the patient suffers.

Although this statement is undoubtedly true, I have always present to my mind the fact, that with an engorged liver and portal system, unless a few repeated moderate doses of salts be given, the nasal obstruction will often continue most obstinate and rebellious. A passing bilious attack, with coated, broad, flabby, indented tongue, coppery taste in the mouth, slight nausea, belching of wind, tenderness on pressure over the epigastrium, torpid or relaxed bowels, will often be the forerunner or accompaniment of nasal inflammation producing obstruction, which will only yield definitely to abstemious living and the use of appropriate alkaline remedies. These attacks may be infrequent or frequent, depending much upon the habits and constitutional tendencies of the patient. After many such attacks the liver has slight permanent enlargement, and the stomach fixed catarrhal inflammation. When this is the case we shall often find chronic hypertrophy of the turbinated bodies, doubtless occasioned by frequent recurrent inflammations, and which can only be reduced to a condition permitting free nasal respiration by one or more cauterizations with acid or electro-cautery. And here I would direct attention to the fact of the very great relief afforded to the patient in this manner. Patients who, previous to the cauterization, had been uncomfortable during the day, and sometimes almost sleepless during the night, owing to their absolute inability to get air through their nasal passages, are restored to peace and tranquillity in a few days, or even twenty-four hours, by an innocuous operation in the great majority of cases. To any one who has witnessed the great discomfort, or even absolute suffering, of an individual who has pronounced nasal obstruction, caused in part by thickening of the nasal mucous membrane, and aggravated by an acute inflammatory attack, the amount of positive relief afforded by this local interference is a source of great satisfaction, and, if seen for the first time, of genuine wonder. Whilst entire relief may frequently be afforded by one or more simple cauterizations, there are times where more positive action still is required on account of a thickened, or deviated septum. In these instances we must make use of Jarvis's or Weir's forceps, the nasal saw, or the nasal trephine. Here I would, however, throw out a warning note, that these instruments should be used only when really required, as their employment makes a raw surface which requires time and care to heal entirely, and in rare instances leaves an ulceration or scarred area, which causes long-continued pain and irritation. Usually speaking, however, the operative procedures on thickened turbinated bodies, or a deviated or thickened septum in a nose in which the condition inside is markedly hypertrophic, are not followed by unpleasant sequelæ nearly so often as when the inflammatory condition takes on an atrophic character. There is, however, a wide-spread belief, not only amongst general practitioners, but also amongst specialists, that the hypertrophic variety of rhinitis, with considerable occlusion of the nasal passages, is the form of disease which occasions most of the distressing symptoms connected with adjacent organs, as the eyes, ears, tonsils, pharynx, larynx, and bronchi.

In my belief, this is not true, for several reasons. In the first place, when nasal obstruction becomes very pronounced, it is usually so distressing that the patient demands local interference, and this latter occurs usually before serious complications arise. Besides, so soon as the nasal passages are freed by cauterization, or other operative procedure, the relief afforded to the patient is, as a rule, rapid and evident. Finally, to repeat myself, the complications of an obstructed nose are not so considerable or frequent as one is led to infer by reading late periodical literature on this subject. Of course, suppurative otitis, sunken drum membranes, ankylosed ossicles, chronic conjunctivitis, hay fever, or bronchitic asthma, may all be occasioned by occluded nasal passages.

It is well to remember, however, that the worst forms of these troubles are usually found in patients who have free nasal respiration, and are unmindful, to a great degree, of their intra-nasal condition until their attention is directed to it by the specialist as the cause, or concomitant condition, of disease in adjacent organs. The relatively free nasal passages with dry irritable membrane, somewhat glazed surface and obvious thinning of the membrane itself, whilst the vessels often bleed profusely from the slightest irritation, are the cases which I dread the most, so difficult do I find it to improve or wholly relieve this condition. Here, again, the question comes up, How must we treat these cases, locally or generally, or by a happy combination of both kinds of treatment? In these instances, all harsh local measures should be absolutely avoided. In some of them I have found that cauterizations, especially with the electro-cautery, have healed with great difficulty. Indeed, on one occasion that I recall with considerable regret, although fortunately I was not the operator, I doubt very much if the ulceration ever got entirely well. There seems to be so little vitality in the tissues that they are unable to recover from any loss of substance, except with the greatest care and attention on the part of the physician.

In the way of local remedies of very many kinds that I have tried in the form of inhalations, sprays, and powders, there are none which have been of very great value in establishing a cure. I am of the opinion, however, that mild carbolized ointments, applied upon cotton-wrapped probes, have been most useful in relieving the dryness and irritability of the nasal mucous membrane.

In those individuals particularly, in whom the tendency to the formation of crusts and scabs is most pronounced, there is nothing so beneficial locally as keeping the surfaces constantly coated with an ointment, the base of which is vaseline or oil. Goulard's cerate is one of my favorite remedies, when it is freshly made and when the crusts are attached to the septum near the nares. Indeed, whenever these crusts are intimately adherent to an ulceration of the septum at this level, and are related to it either as a cause or a result, I have found latterly that I have obtained as good or better results by keeping the crusts and underlying mucous membrane thoroughly lubricated with an ointment, as by occasional applications of any astringent or caustic fluid. The saturated solution of the sulphate of copper was formerly much used by me in these cases, but during the past two years, especially with my patients who will carry out my instructions carefully, I rarely employ this application. Inasmuch as I find a diathetic condition present in many instances, notably rheumatism or gout, I have sent such patients to Sharon or Richfield, during the summer, and during the winter I find judicious alkaline treatment, with or without the addition of colchicum, as the most beneficial I can institute. Indeed, without this general medication, I find that local treatment has comparatively little value. Take, for example, those too frequent cases of atrophic catarrhal inflammations of the nasal and naso-pharyngeal mucous membrane, which ultimately produce such regrettable results in causing chronic dry proliferative aural catarrh. The sunken drumheads and ankylosed ossicles are, in these instances, as we all know, the anatomical factors connected with greatly impaired hearing and tinnitus aurium of a sort to relieve which anything done locally, short of removal of the membrane and ossicles themselves, seems wholly powerless.

Whilst I cannot claim from any general treatment to have cured these conditions when they were far advanced, or when the tinnitus had become a constant symptom in the disease, I am quite sure that I have prevented the local stage more than once from reaching that state in which life itself is at times almost unendurable from unceasing noises in the head. This surely is no small thing accomplished, if we once realize how many bright intellects have gone to waste, and how many times the happiness of a household has been destroyed by an affliction which the aurist alone claims to treat, and which, I believe, properly understood, may surely be helped by the timely intervention of the general practitioner.

I know a lady in middle life, formerly a patient of mine, who was a constant subject for eye, ear, and throat treatment during several years, who now allows these organs to remain unmolested because she does not suffer with them, and because she has been greatly improved in general health by strictly carrying out treatment suitable to her rheumatic dyscrasia.

I had a young lawyer friend and relative under my care some years ago, who has since died, after a too brief and brilliant career, who was more relieved of the distressing symptoms connected with chronic aural catarrh by two seasons at Aix-Les-Bains than he ever was by the continuous treatment of different distinguished aurists and laryngologists in America and Europe.

Such examples have made a lasting impression on me, and with a broader and larger experience I feel competent to give them their full value and to translate their bearings to those before whom I have the pleasure and honor of reading this paper.

There is a most obstinate form of cough occasionally explained by hysteria, anæmia, a disordered stomach, fibroid changes in the lungs, puberty (as Sir Andrew Clarke would have us believe), which, I am sure, is simply dependent upon an enlarged lingual tonsil.

Try all kinds of general treatment that you may, give change of air and habits, tone up the system by every sort of corroborant, and sometimes such a cough will defeat all your best directed efforts. Local treatment judiciously employed, will alone at times relieve persons thus affected.

Such a case was under my care for several weeks last winter at St. Luke's Hospital, New York City. The patient was a young woman, single, and somewhat anæmic, and presumed to be hysterical. From these standpoints all rational treatment was tried until it was proven to be utterly futile. The patient was then placed in my charge. Upon examiuation I found she had a very much enlarged lingual tonsil which pressed upon the anterior surface of the epiglottis and lapped over a portion of its free margin.

Active cauterization with the electro-cautery repeated several times at intervals of a few days, reduced materially the size of the tonsil and relieved the cough entirely.

I would not have my hearers believe, however, that all enlargements of the lingual tonsil can be thus cured. On the contrary in some cases that I have seen even after very thorough cauterizations the tonsil has remained undiminished as to its increased size, or else it has been smaller for a time and afterwards has become, more or less rapidly, quite as large as it was at the beginning of local treatment.

Finding this to be true, I have naturally searched for the cause. In some instances I have found the profession at fault, or, rather, the use of the voice adjoined to a profession which is especially trying to the vocal powers. In more than one instance the vocation was that of a nurse, in another a preacher, in a third a broker.

Occasionally the profession itself did not seem unfavorable until upon close questioning, the patient showed that from necessity he, or she, was forced to make immoderate, or injudicious, use of the voice. This bad habit was frequently allied to a general condition decidedly poor in which anæmia and lowered nerve-nutrition were clearly integral factors in the case. Of course the treatment in these examples was directed as far as could be to the correction of the evident great defects in the mode of life.

Occasionally I have discovered that an underlying rheumatic dyscrasia was alone at fault, and so evident has this been—notably in one of my cases reported in the New York Medical Record, last winter, that every time the joints became more or less painful the throat was relieved and the lingual tonsil was visibly smaller in size and less angry looking. In a patient under my care at the present time, a bachelor forty years of age, of excellent general health, with, however, a rare outbreak of lithæmia, owing to too rich diet, there have been at various times marked symptoms of throat irritation due obviously to the presence of an enlarged lingual tonsil. More than once the most annoying symptom was that of a recurrent, obstinate, paroxysmal cough with little expectoration of phlegm. In fact there were scarcely any sputa at all, but merely an unpleasant feeling of dryness localized at the base of the tongue, and the occasional raising of a small pellet of inspissated mucus. This dryness could be quite effectually soothed for a while by applications of carbolic acid and glycerine (fifteen grains to the ounce). Unfortunately, this sensation soon returned, and nothing I could do would entirely relieve it. After a somewhat prolonged hot spell, with a close, muggy atmosphere, my patient had a very distressing attack of facial eczema. No sooner had the eruption fairly appeared around the angles of the mouth, and on the skin of the upper lip, than all the throat symptoms disappeared, and the patient had no longer any of the throat disturbances to which I referred a moment ago. Occasionally the phenomena are different from those already described, and the sensation of a foreign body constantly in the throat, with that of a band constricting it more or less tightly, is what the patient complains of. Every effort of swallowing is painful and difficult, and at night the choking feelings are such that these patients are either prevented from going to sleep, or if they do sleep for a few hours, they awaken with a start and in a state of terror difficult to control. Their breathing is obviously obstructed, their face congested, and large drops of perspiration stand out as beads upon the forehead, thus betraying their anxiety and physical distress. Steam inhalations impregnated with turpentine, or benzoin vapors will relieve such cases when nothing else will. Beware of attributing them to the existence of spasmodic asthma, or to that sort of dyspnœa and dread caused by a chronically diseased and laboring heart. Last spring I had under my care a young lady sent to me from the New York Hospital, who had gone without solid food during six weeks for fear lest she should choke to death if she made an attempt to swallow anything of firm, or semi-solid consistence. All my persuasive efforts, all my simulated severity remained without effect for many weeks, and my patient grew weaker daily, and was the source of much solicitude to her family and friends. It is true that in this case there was a marked nervous element present, and yet antispasmodic drugs, although thoroughly tried, were not of the slightest benefit. The lingual tonsil itself was notably enlarged, and at one time lapped over the free border of the epiglottis in such a way as to considerably interfere with the movement of this organ during deglutition.

I burned away this portion of the tonsil with the galvano-cautery, and hoped thus to give relief to my patient. Unfortunately I failed in my endeavor, and it was finally determined to try what vigorous outdoor exercise, especially riding on horseback, more attractive surroundings, and complete abandonment of local treatment, would do for her. The result is not at present known to me. I am of the opinion, however, in view of this and other instances of an analogous character met with, that many cases of so-called "globus hystericus," are unquestionably dependent upon the presence of the enlarged lingual tonsil. I am not at all sure that all these cases will be cured, or even benefited by rational local treatment. I am persuaded, however, that some sufferers must be thus treated in order to effect a cure. In view of these statements it should also be urged that in hysterical girls not only should we examine the condition of the throat to see if the lingual tonsil be enlarged, but also inquire closely into the condition of the uterus and its function. An anteverted or retroverted uterus with profuse or painful menstrual periods, is often, as we know, the source and pabulum, so to speak, of the hysterical and anæmic condition, and, incidentally, such conditions are likewise efficient factors in producing enlargement of the lingual tonsil. I think all present will therefore agree with me, that a wise specialism makes one extremely conservative and loth to interfere unduly, either medically or surgically, with apparent abnormal states of one organ, before the other organs and the general system have been brought under the closest scrutiny. As I become older, and I trust better versed in the practice of medicine, nothing fills me with more wholesome regrets than the knowledge of the large numbers of persons who are victims of well meaning, but also very narrow and ignorant advice and doing.

If the patients of these blind men fell into the ditch together with their counsellors there might be some slight compensation to intelligent observers, but when the former alone are the sufferers in having their pockets depleted and their bodies made more ailing, there is in truth no equivalent, ever so small, to be found. In some of the instances of enlarged lingual tonsils, we shall notice that the faucial tonsils are also increased in size, and there is more or less adenoid hypertrophy at the vault of the pharynx. In more numerous cases the fauces, pharynx, palate, and even the faucial tonsils themselves are in relatively very good condition, and unless we make use of the laryngeal mirror, or attach absolute credence to the symptoms referred to already, we should be prone to be skeptical as to the existence of the enlarged lingual tonsil. One glance, however, into the large reflecting laryngeal mirror is enough to do away immediately with all our doubts, as we shall see the glosso-epiglottic fossæ wholly filled up with a large mass of adenoid tissue where normally, as we know, there are two quite considerable excavations. One of the errors of the day, as I believe, on the part of some of the throat specialists, even the most eminent, is to attribute too great importance to the nasal organ as a cause of laryngeal inflammations. This is so true, that at least one of the physicians to whom I refer appears to believe that we may safely ignore much treatment, either local or general, directed to the larynx, and that by sawing off any projections which may exist from the nasal septum the larynx will right itself, the hoarse voice will become pure again, and painful deglutition an unconscious act.

Speaking in this connection Bosworth writes as follows (Trans. Am. Clim. Assoc., 1884, p. 67): "Chronic catarrhal laryngitis, then, I believe to be really a symptom rather than a disease. It is one of the results and accompaniments of catarrhal inflammation of the nasal mucous membrane, rather than a morbid process commencing in the laryngeal cavity;" and upon page 68 he writes: "In the past three years I do not recall a single case of chronic laryngitis which has not been cured. During this period I have entirely abandoned all local applications to the larynx, and have treated the nasal disorder which I have found to be present in every case."

I cannot share such views and mainly for the reason that I see too many acute and subacute cases of laryngeal inflammation, in which this condition is the essential disease from which the patient suffers, and upon which all his painful symptoms depend.

If we treat these patients solely with general remedies, we obtain, usually, poor and slow results. They must be treated locally, and after a large experience I am confident that astringent applications and soothing sprays, notably of carbolic acid and the bicarbonate of soda, are most beneficial. Occasionally, however, both local and general treatment of the most rational kind will prove to be wholly ineffective and the patient will continue to cough and expectorate indefinitely, or until we give him a radical change of air. If he be at the sea-shore, send him to the mountains; if he be in the interior where the air is dry, elevated, and bracing, let him have the moist and more soothing atmosphere of a healthful resort upon the coast. If he be in a large city or town, transport him into a more salubrious environment such as either mountain or sea-air afford.

With respect to change of locality, there is one consideration which should be borne in mind, that is the fact of the presence of malarial germs in many places in this country. If unfortunately our patient be already a sufferer from miasmatic poisoning, he will be more surely benefited, as a rule, by judicious anti-malarial medication, so far as the inflammation of his upper air-passages is concerned, than by any mere change of climate. There are, however, exceptions to this law, and I have occasionally known patients in whom medicines had become of very little service, where a change caused very rapid and marked amelioration of their condition. If our patient, thus affected, go to another malarial place, he will derive no benefit whatever from change. If he go to a *relaxing* sea-side resort, even if it be wholly free from malaria, he will not surely get rid of his catarrh, his cough, or his general throat irritation. I have been witness too frequently, during the past ten or twelve years, of instances in which patients have gone to the sea-shore with the anticipation of being thus benefited, and who have returned home much disappointed at a different result, *not* to attach great importance to my statement. I am not sure that sea-side places do *ultimate* harm to malarial patients. I am confident, however, that they bring out more prominently certain malarial manifestations, which previously had been latent or ignored. Among these symptoms those pertaining to the nasal passages and throat were particularly harassing. During the past summer at Newport, Rhode Island, important facts relating to this subject have become indelibly stamped in my mind. Thanks to the learned and courteous co-operation of my friend Dr. Siegfried, surgeon in the United States Navy, I have been able to observe in several cases hæmatazöön malariæ of different and interesting forms in the blood of those who had other and different ailments it is true, but who, also, were constant, or periodical sufferers from catarrh, pharyngitis, laryngitis, or some form of catarrhal inflammation of the upper air-tract.

One subject which has been of very great interest to a large number of accurate and painstaking clinical observers has been that of the proper treatment of hay fever, or hay asthma. Of course these cases like other instances of disease, are not all similar, and the treatment which appears to be of great benefit at times, is wholly negative at others. Still in reflecting upon my own experience with this disease, I am confidently of the opinion that local treatment is more important than change of residence, and, further, that the peripheral nerves in the inflamed nasal mucous membrane are oftener a source of the sneezing and other painful symptoms of the disease than the great irritability, or sensitive condition of the nervous centres.

I have read with much interest some of the contributions of Dr. Beverly Kinnear in regard to the remarkable curative effects obtained by him in the treatment of hay fever with the spinal ice-bag. I have not, I regret to say, been entirely convinced by his statements, either of the entire correctness of his theories or of the curative results obtained.

Whilst it seems to me proper to make this statement in view of the great importance Dr. Kinnear attaches to his treatment with the ice-bag, I am happy to add that in conjunction with cauterization of the most sensitive areas in the nose by means of the galvano-cautery, or carbolic acid and glycerine, I believe very favorable results can be obtained in a large number of instances of an obstinate and most painful disease.

There are many other topics that I would like to touch upon even lightly and thus have the benefit in the discussion which I trust will follow my reading of this paper, of your own important observations and study. Time and your already tried patience forbid me to continue. To sum up. What I desire to say and what I wish most clearly to emphasize is this: For the best treatment of inflammatory affections of the upper air-passages, the general practitioner and the specialist must really work together. You can scarcely separate them if the work accomplished is to be wholly satisfactory. Therefore either the patient must have two physicians to care for him, or he must look to his family medical adviser for such a measure of knowledge in regard to laryngology and rhinology as to render him able and willing to treat inflammatory conditions of the upper air-passages according to the latest and most approved methods. There will always remain, however, a certain number of patients who in view of special complications, or difficulties pertaining to their disease, will improve sooner if they are taken care of exclusively from the beginning of their trouble and throughout its duration, by the well-informed specialist. When a proper estimate is made of the greatest good to the greatest number in instances in which only one physician can be employed, I am confident that the verdict should be that the general physician with only a limited experience in the treatment of nasal and throat diseases, will be a safer and wiser guide than the most skilful and best versed specialist.

## *DISCUSSION.*

F. H. Bosworth, M.D. I have been much interested in Dr. Robinson's paper, and the admirable manner in which he has presented the subject. I do not recall a better presentation of the subject of the lingual tonsil. When he speaks of the influence of the general system on catarrhal diseases, I think that we are confronted with a certain vagueness in the expression "catarrh." The systemic influence upon diseases of the naso-pharynx I fully concede, for they are notably influenced by rheumatism, gout, and diseases of that kind, and especially by derangements of the digestive apparatus. When we come to diseases of the nasal cavity proper I am disposed to think that they are but in a very slight degree affected by constitutional conditions. This distinction between the nose and the naso-pharynx I regard as very important, and Dr. Robinson has not sufficiently regarded it.

E. L. Shurley, M.D. I too, fully, indorse what the writer of the paper has said. It has always seemed to me that this matter of nasal hypertrophy was a relative thing. Regarding bald heads we don't know how long it will be before bald heads will be normal!

So that, for the purposes of this discussion, we might adopt the standard that those noses presenting hypertrophied turbinated bodies or deflected septa are normal, and become abnormal only as soon as they produce some subjective symptom or other of discomfort. It may be, that the man under observation is a chronic snuff-taker, with nasal mucous membrane in a state of continual irritation. Now, it is useless to burn such a person's nasal mucous membrane as long as the habit is indulged. Therefore it occurs to me, that unless the nasal passages present stenosis from chronic structural change, or from more recent inflammatory change, or a growth which results from such causes that surgical interference is not necessary. A few years ago I presented a paper to the American Laryngological Association on the result of, I think, about two hundred observations of the naso-pharynx and pharynx of persons met with in hospitals and elsewhere, who did not complain of any nasal, naso-pharyngeal, or pharyngeal disturbances, many of whom were affected with enlarged tonsils and various degrees of swelling and congestion of these mucous membranes. I know now of two persons who are very fine singers with greatly enlarged tonsils and who will not consent to have their tonsils cut. They have such immense tonsils that I am sure any one of us would advise such cutting. Therefore, as I said before, I think this is a relative matter. We have no standard which can be followed as to surgical treatment on a purely local basis.

# A STUDY OF THE SPUTUM IN PULMONARY CONSUMPTION.[1]

By E. L. SHURLY, M.D.,
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THE following thoughts and observations are presented as an outline of some work which Dr. Gibbes and myself have undertaken in an endeavor to trace out the pathology and pathological chemistry of so-called tuberculosis.

That the morbific agent is contained in the sputum there is now no doubt, as attested by the numerous instances of its effects in producing the disease in the lower animals by inoculation or insufflation. That its morbific character can, however, be altered or neutralized by several different chemicals outside of the body, and after introduction into the body, we have shown, as attested by the animals now living, which have been subjected to such tests. But just what the particular properties of sputum are, which produce the several varieties of the disease in question in lower animals, we believe is not yet settled, and therefore it is to these questions that I now invite attention.

The prevailing belief is, that, first, bacteria and then bacterial products constitute the principal, if not sole cause of so-called tuberculosis, in all of its varying clinical phenomena. Be this as it may, there is no adequate explanation of the relation of the tissues involved to these things, from any point of view yet given. In other words, we cannot elucidate the first step in the pathogenesis which seems necessary to prepare the way for the action of the bacteria or their products.

The recent labors of Zuegler, Prudden, Buchner, Behring, Roux, Trouessart, McWilliams, and others toward a chemical analysis of the products of microbiosis, especially of the tubercle baccillus, begin to shed some light on the subject, so that we may hope for a solution of the problems in the near future.

[1] Read before the American Climatological Association, September, 1891.

Yet it seems to us, that a critical chemical examination, in a comparative manner, of the sputum derived from cases representing the recognized varieties of pulmonary phthisis is a necessary first step of investigation, unless it be admitted that tubercle bacilli not only constitute the sole primary cause of these clinical varieties but also the basis of all further steps of pathogenesis. If this were admitted, then why should A. suffer from laryngeal phthisis, who was never exposed particularly, who never suffered from any sensible throat affection, whose family history and mode of life were excellent; and B. of the same family and whose mode of life was bad, who suffered from abrasions and inflammations of the throat and air passages, and who had been exposed particularly, escape or, perhaps, contract fibroid phthisis later in life? And again, why should C. under similar favorable conditions suffer from acute general tuberculosis; and D. subject to similar environment contract laryngeal phthisis, and so on?

If, therefore, as we have seen, the sputum really contains the *materies morbi*, and if, from our knowledge of the morphology and physiology of the tubercle bacilli, we cannot account for the early phenomena, it becomes incumbent upon us, not only to ascertain, if possible, what these products are, but what their relation *is* to the tissue change in the first steps of the disease; that is, whether toxic proteids or alkaloids, originating independently of bacteria, by cell- or lymph-necrosis or alteration, play a part in the morbid process, so that we can form a basis for therapeutic action with more or less exactitude.

Hence, the objects of such study would naturally be to ascertain just what the proteids or alkaloids of the sputum are, in the different classes of cases; whether noxious or not, individually; and whether the product of a morbid process, induced or protracted by tubercle bacilli, or independently of them.

The work of Luckjanow "On the General Pathology of the Cell" is highly interesting in this connection as showing the wonderful metamorphosis which these elements undergo through chemical as well as physical action in disease.

The micro-organisms commonly found in the sputum are of great variety; some of which belong particularly to the mouth, while many (such as the bacillus subtilis, bacterium termo, and micrococcus tetragenus, diplococci, streptococci, staphlococci, pneumococci, and other varieties), have been found in the respiratory passages, and in lung-cavities according to Biondi, Gaffky, David, and others. Although under ordinary conditions saprogenic (Trouessert, Vernueil, Moos, Netler, Zanfal) yet, as suggested by David and Cornil and Babes, any revulsion of the system may render them more or less pathogenic.

The composition of normal sputum, as ordinarily given in the text-books, is as follows: According to Landois and Sterling, it shows microscopically, epithelial cells, and lymphoid cells. The fluid substance of the sputum contains much mucus, together with nuclein, lecithin, and the constituents of saliva.

Under pathological conditions there may be found albumen, red blood corpuscles, pus, elastic fibres, plugs of fibrin, casts of larger or smaller bronchi, crystals of various kinds, fatty acids, and occasionally leucin and tyrosin, Charcot's crystals, hæmotoidin and chlolesterin, fungi, and lower organisms taken in during respiration, threads of leptothix, mycelium, and spores of oidum albicans, various rod-shaped bacteria, monads, and cercomonads.

We are investigating now the sputum obtained from several different cases of pulmonary phthisis, all of which are quite advanced.

Case B.—General tuberculosis.
Case H.—Acute miliary tuberculosis.
Case K.—Chronic fibroid phthisis.
Case D.—Sub-acute phthisis.
Case C.—Ordinary chronic phthisis with large excavation, the case now being under treatment.

Two lines of procedure are in progress: First, by cultivation of the microbes in different media under different conditions; and second, chemical examination, and the inoculation of the several derived products in mice, guinea-pigs, and rabbits. As mentioned before, the work is too incomplete to draw definite conclusions, but a few results have been obtained which may be interesting. Our chemical procedure in the main is something as follows: The sputum is collected in the morning, after the patient's mouth has been washed out with a solution of salt and water. In all instances it is first either boiled from one to two hours, or heated at a high temperature in a culture-oven, having been mixed with either distilled water, alcohol, solution of sodium hydrate, hydrochloric acid, or saturated solution of sodium chloride, in equal proportions. Concerning mucin, we find that it varies very much in its reactions according to the specimen. From several specimens we were unable to separate any at all. We thoroughly believe with Lowenberg that mucin varies in its nature according to the animal or substance from which it is obtained.

H—sputum. Four ounces of this was diluted with an equal part of water, and two drachms of sodium hydrate were added; it was then boiled with an inverted condenser for two hours over a sand-bath and filtered. The clear filtrate gave the following reactions:—

| *Reagents.* | *Precipitates.* |
|---|---|
| Alcohol | Faint white. |
| Ammonium chloride | White. |
| " hydrate | None. |
| Silver nitrate | A dirty brown. |
| Barium chloride | White. |
| " hydrate | Brown. |
| " nitrate | White. |
| Calcium chloride | " |
| Copper sulphate | Blue. |

Part of the original filtrate was acidified with acetic acid, and lead acetate was added in excess. The resulting white precipitate was filtered off, and hydrogen sulphide was passed through the filtrate to remove the lead. After standing in a test tube plugged with cotton, and after the precipitated sulphur had been removed, the extract thus freed of mucin, which was acid, gave the following reactions:—

| *Reagents.* | *Precipitates.* |
|---|---|
| Lead acetate | None. |
| Gold chloride | " |
| Potassio-mercuric-iodide | " |
| Phospho-molybdic acid | " |
| Phospho-tungstic acid | White. |
| Sulpho-salicylic acid | None. |

The precipitate obtained with phospho-tungstic acid was washed and desiccated over sulphuric acid.

The whitish residue was stirred up with a little distilled water, and five minims were injected into a mouse. The animal was sick for a week, and after several weeks escaped.

A portion of the original filtrate was placed in a test-tube and carbonic acid gas was passed through it for twenty-four hours; this was then allowed to stand for two weeks. A white precipitate gradually formed. The supernatant fluid was decanted off and treated as follows:—

| *Reagents.* | *Precipitates.* |
|---|---|
| Phospho-molybdic acid | White. |
| Phospho-tungstic acid | " |
| Tartaric acid | " |
| Lead acetate | " |

Five minims of this supernatant fluid were injected into a mouse. The animal lived twenty-two days (the same number of days that the animal lived that was injected with the glycerine extract of the B—sputum). The post-mortem examination showed a general softening of the tissues.

C—sputum. Four ounces were treated with an equal quantity of a strong solution of tartaric acid, shaken at intervals during an hour, and filtered. The clear filtrate gave the following reactions:—

| *Reagents.* | *Precipitates.* |
|---|---|
| Phospho-molybdic acid | White. |
| Gold chloride | None. |
| Sulpho-salicylic acid | White. |
| Phospho-tungstic acid | " |
| Lead acetate | Dense white. |
| Ferric chloride | None. |
| Potassium ferricyanide | Green. |
| " bichromate | Red. |
| " ferrocyanide | White. |
| Tannic acid | Dense greenish-yellow. |

Two and a-half grains of the phospho-tungstic precipitate were rubbed up with fifteen minims of pure glycerine, and three minims of this mixture injected into a mouse. The mouse died after three days. A like solution of phospho-tungstic acid did not kill the control mouse.

Four ounces of the sputum were treated with eight ounces of water and thirty grains of citric acid, shaken frequently for an hour and filtered. This gave the following reactions:—

| *Reagents.* | *Precipitates.* |
|---|---|
| Lead acetate . . . . | None. |
| Hydrochloric acid . . . | " |
| Nitric acid . . . . | " |
| Platinic chloride . . . | " |
| Mercuric chloride . . . | " |
| Tannic acid . . . . | Slight gray |

This shows entire absence of albumens. The gray precipitate may have been due to a trace of iron. Twenty-five minims injected into a rabbit failed to produce death, as also twenty-five minims, injected into another rabbit, of the filtrate procured from the tartaric sputum. Two ounces of sputum were treated with an equal quantity of alcohol, heated gently over a water-bath for fifteen minutes, and filtered; lead acetate was added, hydrogen sulphide passed through, filtered into a test-tube plugged with cotton, and allowed to stand two weeks. This gave the following reactions:—

| *Reagents.* | *Precipitates.* |
|---|---|
| Lead acetate . . . . | None. |
| Gold chloride . . . . | Brownish-black. |
| Sulpho-salicylic acid . . | None. |
| Potassio-mercuric-iodide . . | " |
| Phospho-tungstic acid . . | White. |
| Phospho-molybdic acid . . | " |

Five minims of this alcoholic extract (mucin free) were injected into a mouse. The animal died in fifteen days. The precipitate with phospho-molybdic acid was stirred up with distilled water, and five minims were injected into a mouse. The animal had a convulsive chill lasting until death, which occurred after eight hours. The control mouse did not die.

A quantity of sputum was boiled with an equal bulk of water strongly acidulated with hydrochloric acid, and filtered. The clear filtrate gave the following reactions:—

| *Reagents.* | *Precipitates.* |
|---|---|
| Phospho-molybdic acid | White. |
| Gold chloride | Yellow. |
| Sulpho-salicylic acid | White. |
| Potassio-mercuric-iodide | " |

This last precipitate was thoroughly washed and allowed to settle. The heavy flaky mass was soluble in boiling nitric acid, but not in cold acid; soluble in cold hydrochloric acid. Heated with sulphuric acid a rose-colored opaque solution resulted. The precipitate was soluble in ammonium hydrate, insoluble in ether, readily soluble in ammonium sulphide. Solutions of this precipitate in ammonium sulphide, when injected into mice, caused speedy death; however, the control mice, injected with the ammonium sulphide alone, died in a short time also. We are now engaged in trying these solutions upon larger animals which do not succumb to the ammonium sulphide. Fifteen minims of a solution of this precipitate in ammonium sulphide, when injected into a guinea-pig, produced constitutional disturbances characterized by swelling of the glands of the neck, which diminished after two or three days. The precipitate, when rubbed upon an abraded surface of a rabbit's ear, produced an intense local inflammation lasting for several days. Nevertheless, the animal seemed to recover soon from any general illness. When the precipitate was treated with alcohol, it was found that a portion of it was dissolved; the alcohol was then decanted off and evaporated until a grayish powder remained. A ten per cent. solution of this powder (in glycerine) injected into a mouse caused death in ten minutes. A quantity of this same sputum was treated with an equal bulk of alcohol acidulated with acetic acid, boiled and filtered.

This gave the following reactions:—

| *Reagents.* | *Precipitates.* |
|---|---|
| Phospho-tungstic acid | White. |
| Phospho-molybdic acid | " |
| Gold chloride | Yellow. |
| Potassio-mercuric-iodide | White. |
| Sulpho-salicylic acid | " |

D—sputum. This was diluted with an equal volume of distilled water, and kept at 99° F. for twelve hours, and filtered three times (it gave a slightly acid reaction). This preparation produced the following reactions :—

| *Reagents.* | *Precipitates.* |
| --- | --- |
| Nitric acid | White ring. |
| Lead acetate | " |
| Hydrochloric acid | None (cloudy after standing). |
| Ammonium carbonate | " |
| " chloride | " |
| " hydrate | " |
| " oxalate | Slightly cloudy. |
| Silver nitrate | Slightly yellow. |
| Barium chloride | None. |
| " hydrate | White. |
| " nitrate | None. |
| Calcium chloride | " |
| Copper sulphate | " |
| Ferric chloride | " |
| Ferrous sulphate | Cloudy. |
| Platinum chloride | " |
| Ammonium sulphide | None. |
| Hydrogen sulphide | " |
| Acetic acid | Slight. |
| Potassium ferrocyanide | None. |
| " ferricyanide | Very slight. |
| " iodide | None. |
| " carbonate | " |
| " hydrate | Very slight. |
| Gold chloride | None. |
| Tartaric acid | White. |
| Potassio-mercuric-iodide | " |
| Formic acid | " |
| Phospho-molybdic acid | Blue. |

We failed to produce any alkaloidal crystals from any of these precipitates.

D—sputum. An extract of this sputum was made with hydrochloric acid, and diluted one-half. Of this five minims were injected into a mouse, which died on the eighth day, having shown severe constitutional disturbance.

K—sputum. This was diluted with an equal volume of distilled water, and boiled for four hours with an inverted condenser over a sand-bath and filtered, and the filtrate labelled A-1. To the residue on the filter-paper a saturated solution of potassium carbonate was added and allowed to pass through. This filtrate was labelled A–2. Alcohol was then added to the residue on the filter-paper and filtered. This filtrate was labelled A–3. Ether was added to what still remained on the filter-paper, and this filtrate labelled A–4.

A–1 was a milky fluid alkaline in reaction, and contained sugar by Fehling's test. Boiled with nitric acid it became clearer.

A–1 gave the following reactions:—

| *Reagents.* | *Precipitates.* |
|---|---|
| Platinum chloride . . . . | None. |
| Mercuric chloride . . . | " |
| Hydrochloric acid . . . | " |
| Nitric acid . . . . . | " |
| Copper sulphate . . . . | " |
| Boiled with potassium hydrate . | White flocculent. |
| Lead acetate . . . . . | White. |
| Silver nitrate . . . . . | Slight white. |
| Ammonium oxalate . . . . | White. |
| Gold chloride . . . . . | None. |

The precipitate obtained with potassium hydrate and heat was filtered and the residuum washed, dessicated, and a five per cent. solution was made in water. Of this solution five minims were injected into a mouse. The animal died seven days afterward. No alteration of tissues noted on post-mortem examination.

A–3 gave the following reactions:—

| *Reagents.* | *Precipitates.* |
|---|---|
| Tannic acid . . . . . | Dense gray. |
| Phospho-molybdic acid . . | Slight white. |
| Phospho-tungstic acid . . | Dense white. |
| Acetic acid . . . . . | None. |

Five drops of the A–3 solution injected into a mouse caused the animal's death in an hour.

B—sputum. This was diluted with an equal part of glycerine heated over a water-bath for half an hour, and then filtered by means of an exhaust pump through a plaster plug in the funnel. Three minims of this injected into a mouse caused death in twenty-two days. Post-mortem examination revealed a general softening of the tissues, but no particular local change.

Another portion was treated with water and ether, shaken thoroughly, and allowed to settle. The ether was then removed by means of a separating funnel, alcohol was added to the residue, and separated. The ether extract failed to show any reaction with any reagents at our disposal; and, when allowed to evaporate, left a scarcely perceptible deposit. The alcoholic extract failed to respond to all reagents used excepting tannic acid. From this we may conclude that heat is necessary in the process of chemical separation.

It may be asked what these precipitates are: whether acid albumen, alkali albumens, alkaloids, etc. We can only reply that we have been unable in many instances to obtain satisfactory results, although following closely processes published by well-known chemists. Mr. P. M. Hickey, also our assistant at the Harper Hospital Laboratory, who is a diligent scientific man and a good chemist, has spent much time and thought, especially in this direction, without being able to identify and classify many of the products thrown out.

We hope soon to be able to show some of the ulterior pathological results in guinea-pigs, rabbits, and monkeys, from the inoculation of the elements of the sputum under consideration. We hope also to learn the effects of so-called bacteria proteids on organic substances, and on the lower animals; and, finally, if practicable, to work out some systematic method for their neutralization in the body.

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## *DISCUSSION.*

J. H. Tyndale, M.D. I have heretofore had explained to me the results of the labors of Dr. Shurly and his coadjutor, and hope that hereafter their labors will result in something more tangible.

Albert L. Gihon, M.D., U.S.N. I do not desire to discuss the matter, but would like to make the suggestion to Dr. Shurly that he continue his investigations and that in the paper which we hope he will give us next year he may suggest some practical way of getting rid of this dangerous sputum being scattered all around. Last December I went to Charleston on board a steamer on which there were some thirty consumptives on their way to Florida, many of whom insisted upon having every window and door in the cabin shut, and all the fires going, and they were expectorating in every direction, soiling carpets, cushions, curtains, and the bedding of their own state-rooms. There was, accordingly, great danger to those of us who had receptive lungs. In the naval hospital of which I have charge, it is easy for me to compel the patients to use the paper spit-cup. I say it is easy— but not so very easy after all, for though when they expectorate in their own wards and under supervision of the nurses I can compel them to use the paper cup, they are less careful about doing so on the corridors and stairways. The majority, however, get so that they will, if they can avoid it, not expectorate, and so contract the habit of swallowing the sputum. So it seems to me that if I could not wholly compel the use of paper spit-cups in a military hospital, it would certainly be very difficult in civil life to prevent people from ejecting sputum in steam-cars and steamboats, which are often overheated, especially those which carry invalids.

So far as there shall be any possible way of disposing of sputum with proper regard to sanitary conditions Dr. Shurly should be the man to discover it by his investigations, and give us the result in his next paper.

H. F. Williams, M.D. I was specially interested with Dr. Shurly's account of his labors. I believe it quite probable that further biological research will discover a great deal of difference in the strength and innocuousness of the bacilli, dependent upon the number of removes from the primary culture of each colony. I do not see how it is possible to explain the violence of the symptoms which exhibit themselves in certain cases without any proportionate lesion except on the ground of violence in the germ itself. I believe one section of Dr. Shurly's paper referred to that.

# GYMNASTIC EXERCISE AS A PROPHYLACTIC AND CURATIVE REMEDY IN CHEST DISEASES.[1]

BY EDWARD O. OTIS, M.D.,

BOSTON, MASS.

IN my capacity as Medical Director of a city gymnasium, I have had occasion to examine physically, and prescribe exercise for a good many men and boys. They were examined on joining the gymnasium and, when they would, at a later period. Of each person examined, the capacity and strength of the lungs were determined by means of the water spirometer and manometer. The circumference of the chest was taken about the nipples and at the ninth rib in the natural and inflated condition; and a stethoscopic examination of the apices of the lungs was made. The heart also, at the aortic and mitral valves, was examined in each case, and rated as strong or fair according to its general action. Although my clinic was one of well people, and not one of diseased hearts and lungs, except in a few sporadic cases, yet the varying conditions of these organs observed inside of the diseased limit, and coming perilously near it, and the effect upon them of systematic gymnastic exercise, scientifically applied and persisted in, convinces me that in gymnastic exercise we have a prophylactic agent of great value in diseases of the chest, and a valuable aid in the maintenance of sound and vigorous hearts and lungs, especially under the trying conditions of indoor or city life. Further, my experience is suggestive of a more extended use of gymnastic exercise as a therapeutic measure of no mean value in actual diseases of these organs. Among men of sedentary habits, between the ages especially of thirty and fifty years, the conditions I have frequently met with are as follows:—

First, a certain lack of vigor and firmness in the action of the heart: this condition I have been in the habit of calling the

[1] Read before the American Climatological Association, September 22, 1891.

"sedentary" heart. The possessor of it is often overweight, and exhibits a shortness of breath on any vigorous exertion. He has probably taken little if any exercise for many years, and never walks up stairs when he can take an elevator. He indulges in an abundance of nitrogenous food, and spends most of his time in an overheated, indoor atmosphere. His increased weight, indigestion, or shortness of breath drives him either directly or indirectly, through his physicians, to the gymnasium, to see what can be done for him there.

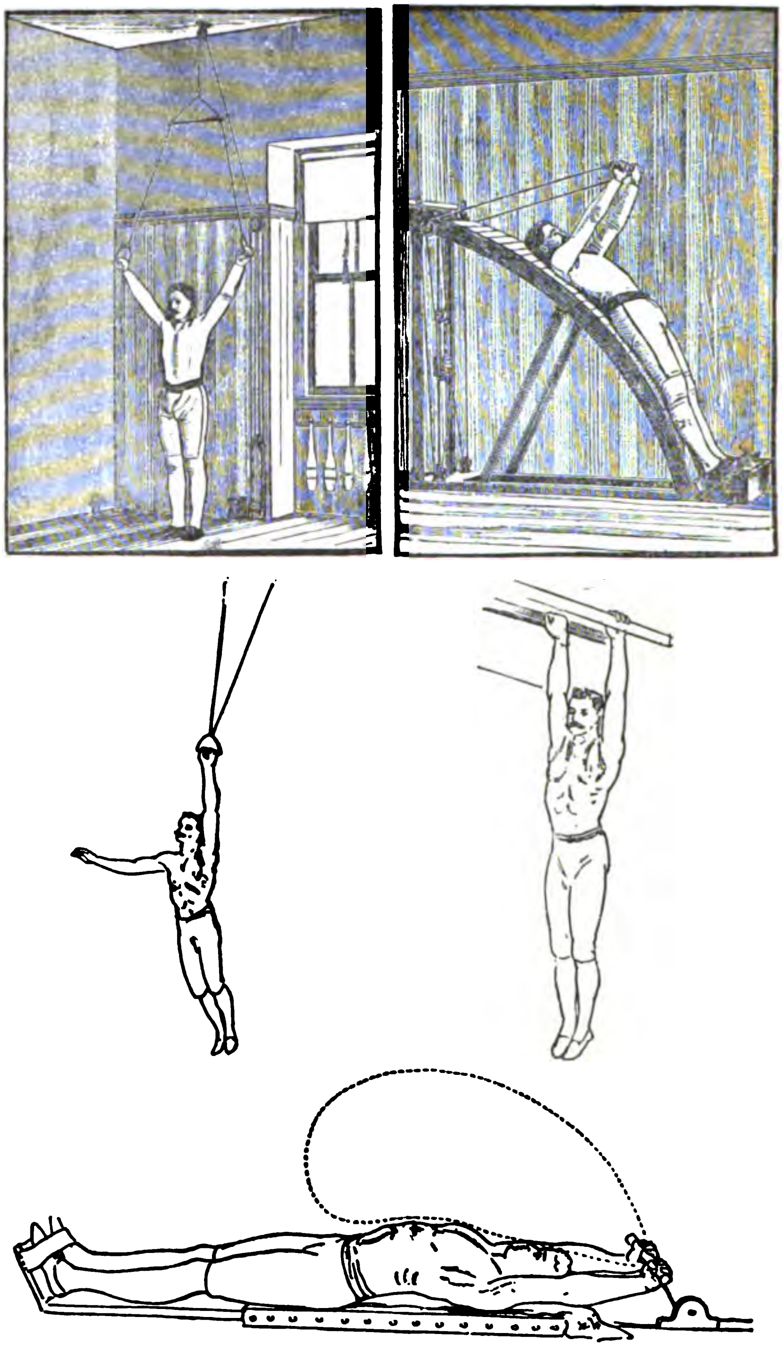
Secondly, poor and incomplete expansion of the lungs is observed; and in this case it may be a thin, round-shouldered man, who leans over a desk all day. The capacity of his lungs does not come up to the average 230 cubic inches, and their expulsive power is below the average number of kilos. The respiration is mostly diaphragmatic; and the intercostals, either from disuse or lack of training, take very little part in it. The difference in the girth of the chest in repose and full may not be more than one or two centimetres. At the apices of the lungs on full inspiration a crepitant râle or two are heard which reveal the fact that he has unused air-vesicles in the top of his lungs. Neither of these conditions is that of disease, but both are a menace to the individual, as easily crossing the border line into absolute morbid states of heart or lungs; or as proving totally inadequate to do their part when unusual demands are made upon them, which may at any time occur so long as man and his environment are what they are, and, in consequence, dire results may ensue.

How many deaths one now hears of from "heart-failure." Is not the condition of the heart I have above described provocative of this disastrous accident under unusual stress of disease or excitement?

As preliminary to what I have to say later, I shall give the general method I pursue in the examination and the prescribing of exercise for the men who come under my care: but, first, it may be well to say that my clientele comes from all conditions, and is of all ages, from the boy of fourteen to the old man of seventy. Most of them lead sedentary lives; they are clerks, bookkeepers, artisans of all kinds, printers, stenographers, telegraphers, electricians, photographers, draughtsmen, artists, musicians, students, lawyers, and clergymen. Like the Kulturmensch of Eulenburg, who, "zu athmen vergesse," so, too, do men of these indoor and sedentary occupations not only forget to breathe properly, but many of them have never learned to do so.

A life history is first taken of the man to be examined, with some facts as to his heredity. His strength tests are then determined as accurately as may be—upper and forearm muscles, pectorals, back, and legs, expiratory strength, and capacity of lungs. His weight is taken, and the muscular with more or less of the bony girths. The depth of the chest is taken with calipers, and the breadth of the shoulders, with that of the head, neck, waist, hips, and nipples. The length of shoulder to elbow, elbow to finger-tip, knee to foot, is determined; and the height, standing, sitting, and of the pubes, navel, and sternum. A stethoscopic examination of the heart is made, and of the apices of the lungs. Lastly, a careful occular inspection is made; and the general condition, as to tone of muscles, character of the skin, lack or over-abundance of adipose tissue, symmetry or asymmetry of the body, position of the body when standing naturally, is noted. There are innumerable points in an inspection of this kind which are observed by one accustomed to this sort of looking. Next the exercise is prescribed; the kind, quantity, and method being based upon the data obtained by the examination. Advice as to personal hygiene, eating, sleeping, bathing, and habits of work is also given. The individual is now handed over to the superintendent, who is thoroughly trained in practical work, and, under careful supervision and instruction, the prescription is carried out.

If the person be one of that class to which I have referred, of overweight, with a "sedentary" heart and poor lung expansion, soft muscles, and a low per cent. in strength tests, he is put upon light, slow work at first, whatever it may be. The course I generally recommend is something like the following: Rapid walking or slow running a few times around the track; lung-expanding apparatus of various kinds; some easy courses upon the chest-weights; a little rowing upon a Kearn's machine, which is a most admirable piece of apparatus; some freehand work, or with light wooden dumb-bells. Class exercises may be



**Forms of Lung Expanding Apparatus.**

taken, but with caution at first, for class-work is more or less violent, and one should gradually work up to it. The so-called "medicine-ball" and shot, and the flying rings may also be added. From twenty minutes to half an hour is long enough to begin with, and this but three or four times a week. If all goes well, the duration of the time of exercise and the amount may be increased; instead of running two or three laps, he may run ten or more. Often, after the prescribed work has been gone through with, the individual is allowed, for a little while, to indulge in some favorite form of exercise, if he have such, like swinging the clubs, the use of the punch-bag, or a game of hand-ball. This distracts from the monotony of the routine of the prescribed work, and makes the whole thing less irksome.

After exercising, I generally advise a sponge or shower bath, beginning with warm water and ending with cooler or cold water, according to the reaction. Of course, it goes without saying that the air of the gymnasium should be as pure as good ventilation can make it. In a general gymnasium, where there are men and boys of various ages at work, and all exhibit that relaxation and cheerfulness born of quickened circulation and the pleasure of muscular exercise, our man obtains a certain inspiration from his new surroundings, and enters into his work with a zest and genuine delight; and what greater pleasure is there than that which comes from physical exercise? Of course, this gymnastic work does not preclude out-of-door exercise when the man's condition, his occupation, or the season of the year will allow it. Still, the ordinary forms of out-of-door exercise, walking, cycling, horseback riding, if the man's means will permit of any but the first of these, will not, in my opinion, do for his heart and lungs what a systematic course of physical exercise in a gymnasium, such as I have outlined, will accomplish.

I do not believe the spirometer, as a regular lung exercise, is of much avail; but rather to be used from time to time as a test. The lung expansion must be accomplished by the continued use of the various forms of lung-expanding apparatus (see figure), together with running, and, whenever the gymnasium is fortunate enough to possess a swimming-tank, by swimming. Swimming is *par excellence* one of the best forms of exercise for rounding out the chest and expanding the lungs.

All who have had much experience in gymnastic work—and, indeed, any physician who examines many chests—must have frequently noticed that over-development of the shoulder, back, and chest muscles often proves a hindrance to good and large chest-expansion; the person with such development is likely to be "muscle-bound," in gymnasium parlance; his great and magnificent-looking muscular chest becomes an actual source of weakness to him, and I have not infrequently found that the chest expansion is below the average, and the capacity of the lungs not commensurate with the general strength of the man. This appearance of great strength and vigor is often misleading to one not accustomed to gymnasium work. In such cases all muscular chest work should be prohibited, and such exercises prescribed as will loosen up the hard, tense, chest muscles and develop the intercostals. Compare the chest of an ordinary athlete and that of a swimmer.

If, after such a course of physical exercise in a gymnasium as I have suggested, the man of "sedentary" heart and insufficient lung expansion be examined again several months later, the following changes are likely to be observed: First, the heart will exhibit a tone and vigor in its action which was wanting before. Second, the lungs will indicate fuller and larger expansion and increased strength; and the intercostals, from the exercise they have received, will be performing their proper part in the mechanism of respiration. If of overweight, adipose tissue will have disappeared, and the muscles, instead of being flabby and soft, will be firmer and more elastic. Moreover, the whole aspect of the man will have changed. Whereas, his countenance before looked pasty, dull-eyed, and perhaps haggard, it now shows the freshness and clear-eyed condition of quickened circulation and increased inhalation of oxygen. Further, all the functions of the body will have become quickened. He feels himself "a new man."

This gymnastic remedy which I have described, for these vicious habits in non-diseased lungs, may be applicable, it seems to me, under careful supervision, to actually diseased conditions in their inception.

To promote proper and greater chest expansion, more complete distention of the lungs, and to more frequently and thoroughly change the air entering the lungs, and so insure a greater amount of oxygen, is on the lines, to a certain extent, of the high altitude climatic cure. More rapid and fuller respiration and quickened circulation are what happen to a patient in the elevated health resorts, and they are important factors in the efficacy of this climatic cure. To be sure, we do not get the pure air in our gymnasium which one breathes on the high plateaus, but we do, by breathing it oftener and fuller, make the best use possible of what air we have to breathe; and, moreover, the majority of consumptives have to be treated at home with such means as are available. Merely to tell a patient to breathe deeply and fully is not sufficient. As a rule, he does not know how to do it, and often his intercostals are so weak from inaction that he cannot do it. Something more is necessary; he must be trained by carefully adapted gymnastic exercise. It is not enough to tell him to go to the gymnasium merely; his gymnastic work must only be undertaken under careful and constant supervision, with frequent examinations. Then only will he be benefited and not injured. Consumptives are sometimes advised or, on their own responsibility, attempt physical exercise at home by the use of the well-known chest-weights. This, it seems to me, is of very questionable utility. Pulling at a machine, all by one's self, is insufferably stupid work, and almost the inevitable result is that, after a time, it is abandoned from *ennui*. One needs the incentive to such work which comes from doing it in company with others, as in a gymnasium. Moreover, there is the same objection to it as to all physical exercise which is not carefully adapted to the patient and constantly supervised.

The cardiac diseases most appropriate for the exercise treatment are, according to Oertel, fatty heart and well-compensated heart failures. The mountain-climbing method of Oertel is familiar to you, and you have your opinion with regard to it. The defect in it seems to me that it cannot be as carefully regulated and graded as gymnastic exercise, or the patient kept under such constant surveillance while taking it. As Dr. Schott says:[1] "We cannot say when we may commence with this treatment, or how high or far the patient shall be allowed to climb." "There is always decided danger connected with this plan of mountain climbing," he goes on to say, and he has seen harm done to patients treated in this manner by Oertel and his disciples. He recommends first strengthening the heart muscles by means of baths and gymnastics. "There is no question," says Dr. Leaming,[2] "about the benefit of regulated exercise and deep breathing in strengthening the heart muscles, and in expanding the lungs and chest. A great part of the benefit that comes to the heart in climbing inclines is in the expansion of the chest." He further states that the Swedish movement cure—which is merely scientifically-applied gymnastics, —and the health-lift—which, from its crudeness and danger, has now been abandoned—if used under proper supervision, are better than mountain-climbing, producing less fatigue and nervous excitation, and are safer because they deal more directly with chest expansion; in brief, he means to say that carefully-applied and supervised gymnastic exercise is better and safer, in cases of heart disease, where any exercise is considered proper, than the uncertain form of mountain-climbing.

Professor Liebstein,[3] in a paper upon "Muscular exercise or quiet for heart disease," says that he feels sure, from his experience, that strong, yet quiet movements, with quiet exhalations of air, work towards strengthening and slowing the action of the heart, as has already been made known by Schott.

"In cases where there is failure in complete contraction the distended ventricle is never entirely emptied, and the heart muscles become weary, and in the end incapable of performing their duty. Then by means of quiet, but energetic, muscular exercise the heart is strengthened, stirred up to effectual contraction, and, at the same time, the diastole grows in consequence of the slowing of the pulse. The increase of the arterial blood pressure acts on the vagus centre, more of the distending blood is forced out of the

[1] Discussion at the Sixth German Congress for Internal Medicine, 1887.

[2] International Medical Annual, 1889.

[3] Sixth German Medical Congress for Internal Medicine, 1887.

heart, and thereby the cause of the dilatation removed. Further, the rapidity of the blood stream increases in consequence of the increase of the arterial pressure. Then, after a number of strong contractions, this acceleration extends to the capillaries and the veins, and a better distribution of blood takes place throughout the entire vascular system. The improvement in the quality of blood lightens the work of the heart muscles, and in consequence of the stronger stream in the coronary arteries, the weakening remaining products are more promptly removed."

In cases of failure in which there is no compensation, or in which it has been lost, Liebstein advises first a period of quiet and forbearance, and then some easy form of muscular labor. He suggests the Swedish method improved by Schott. On the ground of his experience of the last four years, he advised the Oertel cure for chlorotics; "but, above all things," he adds, "it must be conducted with the greatest care, and its execution must not be left to the patient himself. The heart should not be allowed to be more rapid in its action than the lungs can follow, for deep breathing has a lightening influence." While, then, there is doubt among specialists as to the benefit and safety of Oertel's method of climbing inclines for certain forms of heart disease, there seems to be no doubt as to the therapeutic efficacy of moderate and carefully regulated gymnastic work for proper cases of heart disease.

This brief paper is but a suggestion of the possibilities of rightly applied gymnastic exercise both in the prophylaxis and treatment of chest diseases. I feel convinced from my own experience that it is a therapeutic resource of no mean value, and it may be that in our attention to climate and drugs, we have either quite forgotten it or undervalued its efficacy. It is a remedy that requires no change of climate to be efficacious, and the cost does not preclude its use by those of little means. It can be used in connection with the climatic cure and may enhance its efficacy. It may be well to add that, in my opinion, the best system of gymnastics is an eclectic one adapted to each especial case, rather than a too careful adhesion either to the Swedish or German system.

Particularly would I emphasize the value of judiciously applied gymnastic exercise to the large class of diaphragmatic breathers either with or without actual lung disease. The intercostals must be trained to do their share in the mechanism of respiration, if this function is to be satisfactorily and perfectly performed. Proper breathing, like proper eating, is with many people an acquired art; to be learned by the well, in order to maintain the integrity of their lungs; and to those of crippled lungs it must be the preliminary step to all other treatment either climatic or medicinal.

Since writing the above, and as a confirmation of the views I have herein expressed with regard to chest gymnastics, I was much gratified, in a recent visit to Dr. Turban's admirable Sanatorium at Davòs, to find that he made use of gymnastic exercise in the treatment of lung cases, with essentially the same movements I have above outlined. I might also incidentally remark that the paths about Davòs are rated as to steepness according to the Oertel system; so that here, if anywhere, his method could be followed with some degree of exactness.

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## *DISCUSSION.*

H. F. Williams, M.D. I am quite sure that, if Dr. Otis can get control of the young people of Boston in time, he can dispute the conclusions that I propose to speak of to-morrow in reference to the outlook for discovering a specific for phthisis. I think there is a time when judicious exercise is of infinite value. At the same time we all know that the dangers of improper gymnastic exercise are very great, and one of these dangers is in producing hyperplasia of connective tissue, as it lowers the elasticity of the lung. Dr. Otis speaks of diaphragmatic breathing more in the way of the nomenclature of the physicians who have charge of gymnasia. I do not think he means by that the restriction of the diaphragm as a muscle. It became my pleasure to observe Edwin Checkley, and I had the opportunity also of examining him in repose and upon exertion. I am convinced that he has great control over his diaphragm. I do not know a muscle one can use properly with any more advantage than the diaphragm, and I can conceive of none more important in the respiratory act. Now, in reference to Professor Checkley in regard to his muscular condition: he is not muscle-bound, in fact, in tranquillity, his muscles are as soft as those of any lady of ease and refinement in Washington, but with an effort of the will he can make them like steel. He believes that every implement that we use to develop the body is so much waste of power until the muscles are prepared to use it. In the system he proposes, the development of the inherent power of the muscles by contraction and relaxation is at the behest of the will power alone. I mention his case as an example of one whose muscles are powerful, without being muscle-bound, and I expect his theories as to the method of attaining this condition are sound. Well-directed gymnastic exercise is one of the most valuable prophylactics for tubercular disease, but I think it should be carefully regulated.

A. L. GIHON, M.D., U.S.N. I wish to emphasize what Dr. Williams has said respecting the necessity for intelligent supervision of athletic exercises. During the time that I was connected with the Naval Academy, the cadets who had carefully directed exercise generally did well, but after leaving the Academy and changing their mode of life to one under which they were compelled to discontinue their exercise, their condition became bad and probably worse than if they had not exercised at all. I know of numerous instances among the famous gymnasts of the Academy, of young men whose subsequent physical life did not fulfil the promise of their school-time powers, some of them being below the average in endurance of the rest of their classmates. At the Marine Barracks at Brooklyn, where the men are provided with gymnastic apparatus and where they engage in exercise without any intelligent direction, hernia is becoming very common.

EDWARD O. OTIS, M.D. In answer to the question of one of the gentlemen who has spoken regarding cycling, I will say that whereas it may be a good form of exercise for strengthening the heart, it does not seem to me equally good for expanding the lungs. I have observed, particularly in England, where one sees so many bicyclists, that there is a tendency to ride with the shoulders bent forward, which is a position not conducive to good lung expansion.

I emphasized in my paper the dangers of exercise which had not been carefully prescribed and was not constantly supervised. The aim of modern gymnastic work is to symmetrically develop the whole body and improve all its functions, and not to make athletes who are often unsymmetrically developed.

As to the intercostal muscles: my experience has been with the men I have had to do with—and they were principally of indoor sedentary occupations—that the breathing was mostly diaphragmatic and imperfect, and that the intercostals did not do their part in the mechanism of respiration. This fault can be remedied by such gymnastic work as will develop these muscles—lung expanding machines.

# VERBUM SAT SAPIENTI.

By JOHN M. KEATING, M.D.,
COLORADO SPRINGS, COL.

THE most difficult thing for invalids to contend with is home-sickness, and really I do not think that physicians fully appreciate this when they send their sick away from home.

An individual after a solemn consultation is ordered away for a certain time. Frequently the doctor suggests that a "few weeks" will be all that is required—he really means months, sometimes years. The "personal equation," so admirably described by Dr. S. E. Solly, in the September number of this JOURNAL, is scarcely thought of. The temperament, tastes, and finances of the patient are scarcely ever thrown into the balance, the *disease* has full possession of the doctor's mind, and considerations of the individual are simply left out. The order is given to "go to Asheville," "Colorado," "California," "Florida," "New Mexico"—I knew a case once where it was "New Zealand"—and whether the individual has money enough or even strength enough to get there is not considered. The instructions differ according to what has lately most impressed the doctor—altitude, or sea-level and equable climate—sometimes the idea seems to grasp the mind of the attending physician that *nolens volens* the patient must get away, and it makes very little difference where he or she goes. I remember once meeting a gentleman from a very malarious part of Pennsylvania, who had an enlarged liver and was much jaundiced and was sent to Jacksonville, Florida. Needless to say Carlsbad finally made great improvement. We are learning the wonderful resources of our own country in the way of climate for various diseases, and as a prophylactic in inherited conditions. There is no excuse whatever why a physician should not keep himself posted as exactly what to expect from climate alone, and as to the merits of the various climates, but unfortunately we cannot prescribe our climate as we can our calomel. It is an unstable affair, far from the ideal, and *per se* is valueless. With it must come *comfort, good food, and contentment.* In other words, it is the establishment and maintenance of nutrition that we want. If this be true for a man how much more so is it for a woman. The former, if he be well enough, can find amusement and occupation outdoors, but the latter has always to lean more or less on home life, her comforts are the comforts of home, her food has to be as near as possible the food of home, and her contentment will be derived from these and her social surroundings.

How rarely is this thought of!

If we limit ourselves alone to this country we have an enormous area to cover. Physicians should study geography, and those who are in such a position as to send patients away by the hundred for climatic treatment should make it a point to visit some of the localities in question during the season of the year for which the resort is especially valuable, and they should not be satisfied with a few days' sojourn at a "five dollar a day" hotel. If their patients are to be benefited at all by climate a residence of months will be imperative, and that means boarding-houses or housekeeping—the *average* boarding-house at an expensive resort, away from the supplies of a generous market, will nullify the good effects of the finest climate one can imagine.

Then take the railway journey. There are few places that are within a day, or a day and night, journey from our large centres. There is no doubt whatever but that we all appreciate fully the comforts of modern travel and are grateful for them; nevertheless, for the invalid there is much that is trying, most fatiguing. The subject of proper ventilation, and heating of cars, and especially sleeping-cars, does not seem to have received the attention it deserves, and certainly, from a standpoint of hygiene, the Pullman car and other *sleepers* are as far behind the times as the "prairie schooner" is to the "vestibuled train." It is to be hoped that the Association of Railway Surgeons, or some influential individual, will take this matter in hand, and give us an antimicrobic sleeper, temperately heated and well ventilated; get rid of the heavy hangings and stuffings, which certainly are germ carriers. For the sea-voyagers much more has been done; the present new ships are models of hygienic perfection.

My object in writing these few words is simply to call the attention of the profession to what I consider a most important subject. If you have patients whom you think will be benefited by a change of climate, be sure first that you are not going to sacrifice advantages you have already for an idea that will not materialize; remember that climate *alone* will be of no value whatever.

Study your case from the standpoint of the individual, as well as his or her disease, and select your place from actual knowledge, either derived from your own personal experience after a thorough investigation, or from that of others who know. When you have decided, write to a prominent physician of the place, give him a history of the case, your diagnosis, the stage of the affection, your patient's temperament, his or her financial condition, and be advised by the doctor as to the probability of success. Let him secure the necessary accommodations, take entire charge of your patient upon his or her arrival; be sure to impress upon the sick one the necessity of following out the instructions of the local doctor, who, from a large experience, is conversant with all the features of the case, and alone competent to bring it to a successful issue. The "home" doctor should surrender his case *in toto* to the one to whom he trusts it, and he should impress his patient with the necessity for the same obedience and implicit confidence that he himself would exact.

# REVIEWS.

HISTORY OF CIRCUMCISION FROM THE EARLIEST TIMES TO THE PRESENT. By P. C. REMONDINO, M.D. Published by F. A Davis, 1891, Philadelphia.

THE full title, as given upon the title page, in addition to the head-lines above, states that the author concerns himself with the "moral and physical reasons for its performance with a history of eunuchism, hermaphrodism, etc., and of the different operations practised upon the prepuce."

In the introduction the author warns all those with prudish minds that he proposes to handle his subject without gloves, and draws numerous instances of far more suggestive plays and writings that are widely countenanced. It is extremely interesting to read the author's opinion of plays that are now advertised upon the posters and novels that are hardly yet out of the critic's hands. The author's style is at times original, as is shown by the following quotation from his introduction, that will also show somewhat the author's proposed method of handling his subject: "This book, however, was written that it might be read, not only read by the Solon, Socrates, Plato, or Seneca, of the laity or the profession, but even by the billy-goated dispositioned, vulgar plebeian, who could no more," etc.

After this *exposé* of the author's intention, he next enters into the great subject of evolution, among other matters attributing the origin of the prepuce to man's necessity, in his arboreal days, for some protection of his glans penis from thorns, bark of trees, leeches, and lizards. In the first chapter the author deals with the subject of the antiquity of circumcision. He proves clearly that the operation, as a religious rite, first arose among the Jews. In the latter part of this chapter the author traces the origin of the practice among certain tribes of natives upon the Western hemisphere to their Hebraic origin, and endeavors to prove by this and other known facts that the two hemispheres were formerly connected by land. Although the author seems here and elsewhere to diverge somewhat widely from the direct line toward his object, this is willingly pardoned in view of the author's happy method of stating important and not widely known historical facts and incidents.

The second chapter is extremely interesting, though short, being a discussion of the various theories as to the origin of circumcision, and therein it is claimed that the rite was merely the outward sign of a covenant instead of an outcome of phallic worship or of the custom of removing the male organ as a trophy of war. In the next chapter there is an account of the spread of circumcision with a description of the operation as performed by the Arabs and Turks, as well as among savage tribes.

"Infibulation, muzzling, and other curious practices" is the heading of the fifth chapter, and, although it is rather foreign to the subject of circumcision, the facts given and the passages quoted by the author give us an insight into some remarkable usages that are not known, as a rule, save to those who have made ethnology one of their careful studies.

It is curious to see how the author, in language entertaining and forcible, sometimes breaks in upon the ordinary course of his narrative. This is especially seen in the seventh chapter, where, in the midst of a description of the miracles of the holy prepuce, the writer enters into a diatribe against quacks, and, going still further from the subject in hand, preaches the doctrine that a regular practitioner should seek every opportunity that offers to consult with quacks and charlatans. Aside from the peculiar transference of thought necessitated by this digression, the author would, by no means, have weakened his book by leaving out the pages devoted to this subject, as not only has it no bearing upon the question at issue, but the author's logic is extremely faulty, and his doctrine vicious, when he advises us to consult with these men whom we know are deceivers and frauds, in order to finally cause their methods to be exposed.

One other digression is amusing, occurring in the chapter upon the history of emasculation, castration, and eunuchism, in which the author suggests that, in view of recent embezzlements and defalcations, it would be well to emasculate bank, city, and county treasurers, as eunuchs are supposed to lose their interest in worldly affairs; the main train of thought being then resumed after the author has suggested to the writers in several contemporary journals, that are mentioned by name, the advocacy of this measure in attempting to produce social reforms. This is not, however, the only way in which the author treats the subject of prophylaxis and its relation to circumcision. Later in the book the author traces to the prepuce the origin of many of the ills of the latter part of life, giving us in a masterly manner the history of many kidney troubles that are due to various forms of obstruction to the urinary flow. That the prepuce, if abnormally developed, may produce secondary renal trouble cannot be denied; but few, if any, will agree with the author in his theory, that the well-known immunity of the Jewish race from various other diseases is to be attributed to the universal practice of circumcision among them. That the man with a long prepuce is more apt to contract venereal diseases can well be granted, and that syphilis is freqently the indirect cause of physical degeneration and of phthisis in the descendants will be granted by all; yet our author does not, in our opinion, allow sufficient weight to the influence exerted by the usually more temperate habits, and more hygienic methods of living in force among the Hebrew population of every district, than among the general average of the uncircumcised.

A very interesting chapter is devoted to the discussion of hermaphrodism and hypospadias, wherein the author relates some interesting facts in regard to these conditions.

In the chapter devoted to the "Reflex Neuroses and the Prepuce," there are collected many of the already reported cases of reflex troubles having their origin in a phimosis, and the author has added some additional cases from his own practice. Although the prepuce is not now considered of quite so much importance as a cause of reflex disturbance as it was a few years ago, there is still sufficient evidence of its influence to justify the space devoted to this division of the subject.

The author, upon page 290, makes an original suggestion in regard to life insurance, viz: that "life insurance companies should class the wearer of a prepuce under the head of hazardous risks, for a circumcised laborer in a powder-mill, or a circumcised brakeman or locomotive engineer runs actually less risk than an uncircumcised tailor or watchmaker." "Were they to offer some inducement, in the shape of lower rates, to the circumcised, as they should do, they would not only benefit the companies by insuring a longer number of years, on which the insured would pay premiums, but they would be instrumental in decreasing the death-rate and extending longevity."

The surgical portion of the book is rather less extended than one would have expected in a work upon a surgical subject; but a good *résumé* of the various procedures required, and some useful methods of averting or combating complications are given.

During the reading of the whole of this work the most prominent feeling present to the mind is that the author is inclined to attribute all the ills to which flesh is heir, to the presence of the prepuce in a normal or abnormal condition. From simple inconvenience up to immediate death, the catalogue of crimes extends. That such should in fact be the author's idea is natural in one who is writing upon a narrow subject, and in one who has evidently so completely studied the field that is covered by his work. As opposed to the faults dependent upon the uncircumcised prepuce we find the author constantly attributing to the performance of circumcision benefits and disease immunity that to one unprejudiced in the matter cannot but appear to be dependent upon much more important and far reaching conditions of life. This, as has been said, is the most prominent and most constant thought after having finished the perusal of this volume. If this over-zeal in the advancement of his subject can be considered a fault, it is far more than counterbalanced by the true historical value of the work.

The book, as a whole, is wonderfully interesting reading, even aside from its medical value. The author has evidently read widely upon the question, and gives us the results in pleasant form, making what might be rather heavy historical matter take on the garb of interesting narrative. While in places the author has seemed to advocate the operation rather more urgently than is demanded, his views are evidently the outcome of deep thought upon the subject, and cannot fail to convince even the most sceptical of the value of circumcision as a prophylactic and hygienic measure.

# BIBLIOGRAPHY.

THE PURIFICATION OF WATER. The address delivered by Professor ALBERT R. LEEDS before the Chamber of Commerce of Rochester, N. Y., May 12, 1891, is given in part herewith.

"This brings me to the treatment of waters by filtration. And at the outset I would like to say that I know of no method by which it is possible to render waters organically pure except by filtering; and, in the second place, I know of no practical method of bringing about that result except by the American system of mechanical filtration and purification. As these statements appear strong and unqualified, I think it is important that I should briefly review the history of our knowledge and practice during the course of the past ten years, in relation to this subject.

"Some six years ago there was, I think, but one city in the United States which attempted to filter its water, and that was Poughkeepsie, on the Hudson. At the present day there are more than one hundred, and the practice is increasing very rapidly. In England, and on the continent of Europe, the practice of filtration is well nigh universal. Some five years ago Jersey City and Newark, in New Jersey, requested me to visit the various water supplies, in England more especially, to study this matter of filtration of their waters, and I found that all great cities, with the exception of Glasgow, filtered their water supplies. The most conspicuous example is London, with its population of five and a-half millions of people. Its water supply is almost entirely taken from the river Thames, and that river receives the drainage of a very great population. The towns are compelled, by Act of Parliament, to purify their sewage to a certain point, but a great deal of filth finds its way into the Thames. By Act of Parliament the several water companies that supply London are compelled to filter their water; and to effect that object they have filter basins which cover more than a hundred acres in area. Their method of filtration is to run the water into large reservoirs containing sand. The sand that does the filtering is about two feet in depth, and supported on a substratum of coarse stone. As the filth is removed it accumulates in a thin layer upon the top of the sand; and when the water—which filters only under the pressure of the four feet, or thereabouts, of water standing in the reservoir—filters too slowly, they are compelled to send a force of men into the filter-basin, shovel off the top layer of sand and dirt, remove it, wash it, and restore it to the filter-bed. The same plan is followed at Berlin and other great cities on the continent.

"*How the Filter-Beds do their Work.*—It is easy to see how they remove the dirt, the gravel and the suspended matter; but how do these shallow basins of sand remove the living organisms—those organisms with which you are all so familiar under the name of bacteria; those organisms which, when they produce typhoid and other fevers, are known as disease germs? That operation was a complete mystery until the last four or five years. But few people had ever seen or examined bacteria before that period. It is entirely a new topic in this country; and the method by which they are removed from the waters was a profound mystery. It now has been shown that the bacteria remove the bacteria. The bacteria in the waters are comparatively few of a dangerous character; the great bulk of them are our greatest friends. It is through their aid, together with the oxygen of the air, that the filth in the water is destroyed. They feed upon it and they feed upon each other. Since that knowledge has been obtained, the object now is to cultivate the bacteria. In order to make the filter-bed do its work effectively, it is necessary that the growth of the bacteria shall be facilitated until a filter-bed becomes populated with an incredible number of them. As the result of their activity they multiply themselves in vast numbers; and they form, at the top of the filter-beds and between particles of sand, a sort of jelly or slime—a bacteria jelly; and it is by the aid of this bacteria jelly that the bacteria in the unfiltered water are removed. The bacteria come down into the pores of the filter, when they are caught by this jelly and they are consumed. And if the rate of movement of the water is slow enough it is possble to begin with water like that of the river Spree, which is a portion of the water supply of Berlin, containing 100,000 of bacteria to the cubic centimetre, and after passing through one of the filter-beds the water which comes out will contain but forty or fifty bacteria. This takes place when the rate of filtration is such that 1,000,000 gallons of water pass through those filter-beds per acre in twenty-four hours. If the rate is diminished until only 300,000 gallons pass through in that interval, the bacteria can be diminished until there are only five or ten per cubic centimetre. But this rate is too slow to permit of an economical use of the filter-beds, and the consequence is that the authorities of Berlin require that the water shall pass through the filter-beds at the rate of a million gallons per acre in twenty-four hours. The interesting fact is thus brought out that some of the foulest water, most polluted with sewage, is so filtered at the present day in the capital of Germany; the filtered water is submitted to the most searching criticism of Professor Koch, whose institute of hygiene is there, and to whose labor our knowledge on this subject is mostly due, and that this foulest of water is there taken, filtered, and then becomes the water supply of Berlin. If we can do as well or better than that, we have every reason to be satisfied that we are on the side of safety.

"The foreign filter-beds, excellent as they are, have never been introduced practically in the United States. Moreover, there is no prospect that they will be. The amount of water filtered per acre is so small that the first cost is a large one. In the second place, the climate of Europe and of England is altogether different from the climate of America. Those filter-beds freeze up, even at London, and the engineers are sometimes greatly troubled. In the next place, in England, even in that temperate climate, a great quantity of algæ develop in the filter-beds. In the United States, with our severe winters and the great trouble you have experienced in Hemlock Lake, from the growth of algæ, engineers are unwilling to undertake such method of filtration. This being the case, the attention of engineers has been directed to find some way of effecting a result which will satisfy our own needs. And the system that I shall bring to your notice in reference to your immediate wants is this American system.

"The filter is simply a case made of boiler iron, of five feet, ten feet, or twenty feet in diameter, made strong enough to stand any pressure to which it is subjected. It contains a bed of sand three and one-half or four feet in depth. The water is passed through the filter under pressure and passes out of the bottom by a series of valves so constructed that they permit the water to pass, but entirely detain the sand. After a time, when the filth accumulates on the surface and through the bed of the sand, the operation is reversed, a current of filtered water under pressure is sent up from below, the sand is washed, and the impurities pass out from a waste-pipe, and then filtration is resumed. In practice, after filtering for ten hours, a filter operating on such water as the Genesee River can be purified by washing in ten minutes' time.

"That it is possible by such a method to renovate the sand and dirt you will probably have no difficulty in admitting; but what will such a filter do with reference to the bacteria? If it is necessary to pass water at so slow a rate where the pressure is as light as that given by a head of four feet as is the case in the foreign filter-bed, how is it possible to pass the vastly greater quantity through one of these American filters? One of these filters of which I have been speaking, ten feet in diameter, under a pressure of fifteen pounds to the square inch, will filter successfully a quarter of a million of gallons per diem. In order to effect that result, it is necessary to have something which will take the place of the bacteria jelly that I have described. And the most successful substitute is a jelly made of hydrate of alumina. It is obtained in this way: All natural water contains in solution carbonate of lime, to which its hardness is due. When sulphate of alumina is introduced into the water it is decomposed by the carbonate of lime, and sulphate of alum is formed and hydrate of alumina is set free. It is a perfectly white translucent jelly. It forms on the surface of the filter-bed in contact with the grains of sand, and when the smallest particle of silt or the bacteria come in contact with it they are caught by it and held. It is possible to entirely remove the bacteria from water by use of this jelly. These filters worked in that manner have been repeatedly tested, and that point has been most carefully established.

"The water that I have sent around the audience this evening is filtered water. It contains no bacteria. They were removed at the same time that the turbidity and the color were taken out. The question then is, whether the bacteria are to be removed by a bacteria jelly or by means of an alumina jelly. There are some who think that no chemical substitute whatsoever can rightly be employed in the purification of water. It appears to me to adopt such a sentiment is to renounce the advantages which the very elaborate study of this question has given to us. They say that hydrate of alumina, which is one-fourth of alum, is very pernicious to health. If alum ever went into your water supply I would concede the point that it is not a proper thing to use; but it does not go into the filtered water. The alum is so perfectly decomposed that I never have been able to find it in the filtered water. The hydrate of alumina is left behind, and the alumina which goes into your water in a minute amount is also present in natural water itself. If you examine the analysis of the river water you will find that the water contains naturally some alumina. It is the alumina in the soil which makes spring water so bright. It is the alumina in the soil which makes the water of driven wells filtered water. All that is proposed in this method is to take advantage of nature's methods.

"In the sample that is before you a quarter of a grain of alum has been used. That is so small an amount that it is difficult to weigh it upon a druggist's balance. Of that quarter of a grain of alum, only one-third is alumina; and one-twelfth of a grain of alumina, or the $\frac{1}{700000}$th part of the weight of a gallon of water, is sufficient to remove all the dirt and all the bacteria by this process of filtration. The quantity is practically infinitesimal.

"Unfortunately, the Genesee water, at the time it was sent to me, was in a very favorable condition. I wish it had been at its worst, because the difference is too slight to show what the process is capable of doing. This method is now in use supplying filtered water in much larger quantities than what you desire to have here. The city of Chattanooga, some four years ago, began taking some three million gallons of water from the Tennessee River. It has now gone on increasing its filtering plant, until it takes six million gallons, and it is all treated by the method I have spoken of. I have here a sample of water taken from the Wabash River at Terre Haute. It is not possible that the Genesee River should ever have water of the character that you see here. It is loaded with mud. The water was so bad that I at first thought, when this sample was submitted to me, that it was a hopeless case. I am interested in this question, as a consulting chemist, from the fact that a great many waters are submitted to me by the people that are engaged in doing this work, and I am desirous of seeing this American system introduced generally. I think it will be universal before many years have passed. And here is one of the samples that was submitted. A plant was put in some year and a half ago to filter this Terre Haute water. The impurities were so great that I said that they could not be successfully handled without using as much as four grains of alum to the gallon. They have been filtering not three, but four and one-half million gallons of water with a three-million-gallon filter plant. And this has been done with two grains of alum to the gallon, and less. The superintendents have been careful not to use more than that, because of the expense. They use less. And this is the largest amount of alum I have ever known to be used practically in the filtration of water.

"I will not detain you longer than by saying I have here a working drawing, showing ten of these vertical filters, ten feet in diameter, which are doing this work at Terre Haute. The water is filtered under a pressure of two hundred pounds, and the filtered water is used for fire purposes as well as for general supply.

"Here is the working drawing of a plant at a place in Kansas: a smaller plant. It is the same size as that at Bordentown, in New Jersey. Long Branch has for the past three years filtered and treated all its water in that way. It was much more deeply colored with peat than the Genesee River water was that came to me, or, it is possible for the Genesee ever to be colored. It came from a cypress swamp. And the filtered water at Long Branch is colorless. And when the health inspector of Providence examined that plant he found that the filtered water contained two bacteria per cubic centimetre, while the unfiltered water contained three hnndred.

"In conclusion, then, I will say that this method is in use in one hundred of our American towns; that those who are using it are extending their plants to supply the increased demand; that by its use in the filtered samples which I have shown you, the organic nitrogen in the Genesee water was cut down to one-half the amount usually present, and also the water in the Hemlock Lake was cut down by the same amount. The Hemlock water, if filtered by this method, would be 100 per cent. purer than delivered to you as it is, and you consider it, as it is, very excellent water.

"At the recent convention of the engineers in Philadelphia the expression of opinion was general that this method of treatment of waters would, in the near future, be generally adopted. When the city of Liverpool put in its new water supply from Vrnywy Lake, the purest water they could obtain in Wales, they put on the descending main a filter-plant; and I said to the chief engineer at Liverpool: "Why do you filter this beautiful mountain water?" and he said to me, "The public opinion in England is so strong in this matter that we cannot supply water unless it is filtered." If you have examined one of those filter systems you will find that all of the filtered water is passed through a well, at the bottom of which there is a pavement of white porcelain, and the engineer and the people are not satisfied without, on looking through a depth of five feet of water, the filtered water should always go over that porcelain and be absolutely colorless. I think the time has gone by in this country when people will be satisfied with taking any water supply without they are made certain of its purity. As I said before, I know of no method of guaranteeing the purity of water except by filtration.

"Mr. President, I trust I have been not too lengthy, I wished to answer the question which was asked: "If a temporary supply of 3,000,000 gallons of water is taken from the Genesee River can it be made colorless, can it be made pure from a sanitary standpoint?" I have answered that it can be, and that the method is one in large use, and is a method requiring so moderate an outlay that it has become feasible for the water supply of cities demanding a great amount of water."—*The Stevens Indicator*, October, 1891.

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CONSUMPTIVE HOSPITALS.—Dr. W. Thornton Parker has recently written a long and interesting article advocating the establishment of a National Consumptive Hospital in the "Western Health Section," based upon the Royal National Hospital in the Isle of Wight.

It would be much better, in our humble opinion, if each State that has any climate at all worth mentioning would create its own institution as it does its insane hospitals (not asylums any longer we are glad to say). The comparative records would be most interesting reading. Let for instance California, Wyoming, Colorado, Arizona, New Mexico, Texas, Florida, Georgia, the Carolinas, Tennessee, Minnesota establish each a "Cottage Sanatorium," well endowed, and treat gratis their own poor, but so arranged that *pay cases* can be received and every advantage of treatment and comfort and luxury given those who can afford it. The probability is that after the institution has been put on a working basis, the pay cases would largely support it, and the appropriation could be used for investigation, laboratory work, statistics, etc. In this way we would be able to find out the merits of individual climates, altitude or sea-level, and a thorough test could be made of all "new specifics" and "cures." But beware of politics and "pathies," so hard to steer clear of in this country, and medical politics as well.

J. M. K.

## CORRESPONDENCE.

HONOLULU, HAWAIIAN ISLANDS,
*Nov.* 6, 1891.

So far the weather has been very warm and sultry, with considerable moisture; but I am told that it is most unusual weather. I hope so, for if it does not improve by January I feel sure I will return to Colorado, where I have so much confidence in the climate which I tested for sixteen months. As far as scenery and tropical appearance is concerned, it is the most truly lovely spot I have ever visited—the flowers, trees, fruits, and vegetables are all that could be desired. Royal and date palms, most glorious cocoanuts and bananas, grow magnificently, and are a wonder to behold. The natives are most interesting—a dark, copper-colored people, with tolerably regular features, straight black hair. The women are quite pretty, but as they advance in years they grow fat and ungainly, and later become attenuated. Their dress suits the climate—a loose gown (holakus) made of white or colored thin material, called with us "Mother Hubbard." They bedeck themselves with flowers of various colors, and are quite picturesque in appearance. The men are self-indulgent and lazy, fine looking, and satisfied to do only enough work to keep them alive. Their principal food is the tava plant, made into mush, and a little fish they catch in the Pacific, which they dry in the sun. They are amiable, cheerful, and musical, and fond of songs, dancing, and horseback riding (the females ride astride).

The Chinese and Portugese form a large class of the inhabitants, with American, English, and German and a few French and Spanish.

The streets are all well macadamized; good street railway system, two telephone companies, electric lights, police and fire departments. The physicians are principally American—a few French and German; and Honolulu has her full complement of them.

The following report may be of interest:—

*Summary of Observations at Oahu College, Honolulu, by Prof. A. B. Lyons*, 1889.

| YEAR. | BAROMETER. | | | | | | TEMPERATURE. | | | | | | | | | ATMOSPHERIC STATE. | | | | | RAINFALL. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily range. | | | For the month. | | | Daily range. | | For the month. | | | | | | | Dew point. | | Rel. humidity. | | | |
| | Max. | Min. | Mean. | Highest. | Lowest. | General mean. | Max. | Mean. | Highest. | Lowest. | Mean of max. and min. | 6.30 A.M. | 12.30 P.M. | 9.30 P.M. | General average. | Highest. | Lowest. | Mean. | Midday. | Night. | |
| Jan. | 0.15 | 0.05 | 0.086 | 30.24 | 29.91 | 30.092 | 18.° | 9°.08 | 79°.5 | 60°.5 | ° — | 66°.92 | 76°.00 | 68°.80 | 70°.88 | — | — | — | — | — | 2.88 |
| Feb. | 0.14 | 0.05 | 0.083 | 30.23 | 29.91 | 30.065 | 19. | 12.68 | 81.5 | 56.0 | — | 64.32 | 77.10 | 66.25 | 69.22 | — | — | — | — | — | 1.00 |
| March | 0.13 | 0.06 | 0.093 | 30.32 | 29.88 | 30.121 | 19. | 11.40 | 82.0 | 60.0 | — | 66.50 | 77.90 | 69.20 | 71.20 | 66 | 48 | — | — | — | 0.85 |
| April | 0.13 | 0.06 | 0.072 | 30.23 | 29.89 | 30.103 | 16.5 | 10.38 | 81.5 | 61.5 | — | 69.22 | 79.60 | 70.74 | 73.19 | 67 | 50 | 61.0 | 56 | 72 | 2.04 |
| May | 0.09 | 0.06 | 0.067 | 30.19 | 29.93 | 30.098 | 15. | 9.08 | 84.2 | 68.0 | — | 71.73 | 80.81 | 75.70 | 76.08 | 68 | 59 | 61.7 | 58 | 73 | 2.48 |
| June | 0.09 | 0.05 | 0.061 | 30.20 | 29.96 | 30.084 | 13. | 9.32 | 84.6 | 70.0 | — | 73.47 | 82.75 | 77.11 | 77.53 | — | — | — | — | — | 2.05 |
| July | 0.08 | 0.04 | 0.060 | 30.11 | 29.92 | 30.030 | 11. | 9.56 | 86.0 | 72.0 | — | 74.74 | 84.30 | 75.84[1] | 78.92 | — | — | — | — | — | 1.41 |
| Aug. | 0.10 | 0.04 | 0.067 | 30.16 | 29.96 | 30.047 | 21. | 8.80 | 87.0 | 66.0 | — | 75.80 | 84.60 | 74.65[1] | 79.60 | — | — | — | — | — | 1.35 |
| Sept. | 0.10 | 0.06 | 0.068 | 30.15 | 29.91 | 30.018 | 14.3 | 9.38 | 86.0 | 71.0 | — | 74.01 | 83.39 | 76.28 | 78.09 | 72 | 62 | 66.3 | 58 | 75 | 2.50 |
| Oct. | 0.10 | 0.06 | 0.076 | 30.13 | 29.95 | 30.057 | 15.5 | 7.64 | 83.5 | 67.0 | — | 73.71 | 81.35 | 75.27 | 76.82 | 69 | 60 | 65.0 | 60 | 74 | 1.98 |
| Nov. | 0.11 | 0.03 | 0.076 | 30.16 | 29.85 | 30.038 | 17.5 | 7.24 | 85.0 | 66.0 | — | 73.38 | 79.62 | 74.11 | 75.40 | 71 | 55 | 64.2 | 62 | 74 | 2.33 |
| Dec. | 0.13 | 0.06 | 0.081 | 30.20 | 29.88 | 30.064 | 13. | 4.77 | 80.5 | 67.0 | — | 71.08 | 75.85 | 72.18 | 73.04 | — | — | — | — | — | 5.40 |
| | 0.15 | 0.03 | 0.074 | 30.32 | 29.85 | 30.068 | 21.0 | 9.11 | 87.0 | 56.0 | — | 71.24 | 80.27 | 73.01 | 74.99 | — | — | — | — | — | 26.27 |

[1] Interpolated for averages.

## METEOROLOGICAL SUMMARY

*For October, 1891, from Weather Service Records, for the Government Station at Púnahou.*

Average temperature, 76.1° F.; normal, 76.7°.

Extreme range of temperature, 68° to 90°.

Mean daily range, 10.3°.

Average minimum, 71.1°; average maximum, 82.2°.

Barometer more fluctuating than in the two previous months.

Average pressure, 30.02; normal, 30.03.

Daily average of barometer, 0.07; extreme range, 0.24—from 29 89, lowest, to 30.13, highest. Low-pressure periods about the 6th and 24th; high barometer periods about the 13th, 20th, and 29th.

Low temperatures on the 9th, 21st, and 29th.

High temperature on the 1st, 10th (highest for seven years), and 25th.

Average relative humidity, 71 (*i. e.*, of 9 A. M. and 9 P. M.); absolute humidity, 7.0 grains per cubic foot (four observations daily).

Rainfall, 4.64 inches; normal, 2.30 inches; total since January 1, 20.54 inches.

Cloudiness, 47 per cent.; normal, 42 per cent.

Wind average (Beaufort scale), 3.0.

Trades interrupted on three days; usual average interruption, 9 days for October.

Periods of weather disturbance, 3d, 12th, and 26th.

An unusual consecutive number of rain-record days, 16, accompanied the cloud belt that prevailed from the 13th to the 26th, and for Honolulu broke the previous seven months' scarcity of rainfall.

C. J. LYONS,
*In Charge of Weather Service.*

## MORTUARY REPORT.

The total number of deaths reported for the month of October, 1891, was 49, distributed as follows:—

| | | | |
|---|---|---|---|
| Under 1 year | 14 | From 30 to 40 | 7 |
| From 1 to 5 | 5 | " 40 to 50 | 6 |
| " 5 to 10 | 1 | " 50 to 60 | 2 |
| " 10 to 20 | 4 | " 60 to 70 | 4 |
| " 20 to 30 | 1 | Over 70 | 5 |

Males, 29; Females, 20.

| | | | |
|---|---|---|---|
| Hawaiians | 34 | Great Britain | 1 |
| Chinese | 8 | Americans | 1 |
| Portuguese | 3 | Other nations | 1 |
| Japanese | 1 | Total | 49 |

Number unattended, 15; Non-resident, 0.

CAUSE OF DEATH.

| | | | |
|---|---|---|---|
| Apoplexy | 1 | Fever | 7 |
| Bronchitis | 3 | Fever, typhoid | 1 |
| Bowel complaint | 2 | Heart disease | 1 |
| Consumption | 9 | Hemorrhage | 2 |
| Convulsions | 2 | Inanition | 2 |
| Cholera infantum | 1 | Obstruction of urine | 1 |
| Croup | 1 | Old age | 7 |
| Congenital obstruction | 1 | Pneumonia | 2 |
| Debility | 1 | Paralysis | 1 |
| Dropsy | 1 | Tumor | 1 |
| Entero-colitis | 1 | Unknown | 5 |

COMPARATIVE MONTHLY MORTALITY.

| | | | |
|---|---|---|---|
| October, 1887 | 48 | October, 1890 | 40 |
| " 1888 | 31 | " 1891 | 49 |
| " 1889 | 46 | | |
| Population estimate:— | | Hawaiians | 37.09 |
| Annual death-rate per | | Asiatics | 21.60 |
| 1000 per month | 25.56 | All other nationalities | 10.28 |

C. B. Reynods,
*Agent Board of Health.*
*—Extract from private letter to Editors.*

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## THE SMEAD SYSTEM OF WARMING AND VENTILATING.

*Dear Sirs:* In reply to your letter of inquiry in regard to the Smead system, and of what it consists, I beg leave to say that the Smead system of warming and ventilating may be concisely described as follows:—

The "air warmers" are an improvement on the old hot-air furnaces, having an immense heating and great reserve capacity, so that they are never overtaxed. They are placed in large chambers in the basement, built of non-conducting material, and pure air, direct from out-doors, is admitted to these chambers in large volume. The warm-air conduits are straight and of ample capacity. By an ingenious device, under control of the teacher, "continuous ventilation" is secured, so that, just in proportion as warm air is shut off, cold air direct from fresh-air supply is admitted, and the warm and cold air mingling, enter the room at the temperature desired; thus the volume of air admitted is quite constant, regardless of the temperature. The foul air leaves the room at the floor-line; thus is the cooler air constantly drawn off, and the warm air above settles down. The outgoing air passes under the floor—imparting some of its warmth to the floor—and thence downward into a centralizing foul-air room in basement. The air from many—generally three or four rooms—passes into this room, which is in communication with the great ventilating shaft. This is of large capacity, and being supplied with a heater at its base, it will exhaust enough air from the three or four rooms ventilating into it to change the air in them about every ten minutes.

The warm-air registers are so placed as to get the most thorough agitation of the air in the room without there being a decided draught on any occupant, and the exhaust registers are many—generally on two sides of the room —so that the air is drawn off from every part, and there are no stagnant corners. Changing the air of the room six times an hour insures to each child 1200 to 1500 cubic feet hourly. This is on the basis of 200 cubic feet room-space to each occupant. If the room-space *per capita* be 300 cubic feet, then the allowance would be nearer 2000 cubic feet hourly. Practically, it is found that with proper outlets, drawing air from many parts of the room, 1200 cubic feet *per capita* is sufficient. The old estimates for minimum air supply were made with but one or at most two outlet places.

This system solves the problem broadly, with ample reserve margin. Everything about it is on a grand scale. Dry closets are operated in connection with it in most instances. The fæcal deposit is dried and burned *in situ*, thus making it an excellent adjunct for hospitals, etc.

Very respectfully submitted,

R. HARVEY REED.

MANSFIELD, O., December 3, 1891.

# ABSTRACT FROM CURRENT LITERATURE.

*The* EDITORS *request that Reports of Papers read before Societies, Reprints of Articles, Letters from Physicians containing matters of General Interest pertaining to the Subjects in the Title-page of this Journal should be sent to the* EDITORIAL OFFICE, 913 WALNUT ST., PHILA., *marked for* CLIMATOLOGIST.

## BACTERIOLOGY.

**The Detection of the Bacillus Typhosus in Water.**—These experiments were performed in the Bacteriological Laboratory of the Yale Medical School, and were reported in the *N. Y. Med. Record*, by Charles Y. Foote, M.D., of New Haven, Conn.

To detect the germ of typhoid fever in water or other fluids contaminated by it, the microscope is of little use unless the germ be first isolated upon some nutrient media and the characteristics of its peculiar colonies studied.

To test the effect of different antiseptics upon the growth of the bacillus typhosus Dr. Foote took an antiseptic jelly, made plates from it and inoculated the surfaces of the jelly plates thus made, each plate being inoculated by three stroke-inoculations. The stroke in the middle being from a pure culture of the bacillus typhosus, and the two on each side being from cultures of ordinary water bacteria; all the bacteria on each plate being exactly under the same conditions in every way, comparison was easily made as to rapidity of growth, etc.

After comparing in this way a long list of antiseptics the result showed that the only antiseptics of any advantage in favor of the bacillus typhosus were alcohol and sodium flurosilicate. To detect the bacillus typhosus in water it was found that the use of agar plates kept at a temperature of 104° F. is more valuable as an eliminating agent than antiseptics.

Keeping the agar plates at a temperature of 104° F. suppresses the growth of the ordinary bacteria found in water, while at the same temperature the bacillus typhosus had a rapid growth. The reverse being true at a temperature of 70° F., the water bacteria of this temperature having a vigorous growth, while the bacillus typhosus had only a fair growth.

(We hope we are not assuming too much if we draw attention to the remarkable analogy that exists between the effect of temperature upon the life history of the bacillus typhosus, as shown in the above experiment, and the results attained during the last year by treating typhoid fever by the cold bath; cold applied in this way has certainly been most successful, and a temperature below 104° F. does retard the growth of bacillus typhosus in pure culture. What exact relation these two facts bear to one another chemical observation assisted by original research will no doubt before long solve.—ED.)

## CLIMATE.

**Cap Martin: A New Health Station on the Riviera.**—As its name implies, this is a small cape, running out into the Mediterranean Sea between Mentone on the east and Monte Carlo on the west. It faces full south, and is far enough removed from the range of Maritime Alps behind to avoid those sweeping draughts which come down the valleys, and which are such serious drawbacks to Mentone and Nice. The whole estate is covered with pines, under which is a rich growth of underwood, consisting chiefly of myrtle and rosemary, making the air most fragrant and pleasant. When the estate is fully developed it will somewhat resemble the East Cliff at Bournemouth, only it will be set off with brilliant blues and greens instead of the almost uniform depressing gray of Bournemouth in the winter. For cases requiring a still atmosphere Cap Martin will be very suitable, as under these trees, even during half a gale, the movement felt in the air is so slight that phthisical patients with a hemorrhagic tendency and cardiac cases are able to go out and get their exercise in safety. Another important feature in Cap Martin is that it is level, thus differing from most other Mediterranean health stations.

The history of the place is this: About two or three years ago a Scotchman, Mr. Calvin White, bought the whole estate of about 200 acres. It was then a dense wood, used as a pheasant preserve, and guns were let out at so much a day to sportsmen from Mentone and Monte Carlo for a day's shooting. This was all put a stop to when Mr. White acquired the property. He immediately formed a small company, and then commenced to develop the estate. Roads were made, the land marked out in sites, and a large hotel built. This hotel was partially opened last year, and this year has been completed. The sanitary work is most satisfactory in every way. A person can live there very comfortably on about fourteen francs per day. The hotel faces due south, and is about four miles from Monte Carlo, to which place brakes run frequently during the day. It is two miles from the Mentone station, where an omnibus meets every train. There is also a small landing stage for boats, so that everything, even including an English billiard table, has been provided for the comfort and entertainment of visitors and invalids.—*London Lancet.*

## HYGIENE.

**The** first meeting of the Assembly of the German Society for Public Hygiene was opened by the chairman, Dr. Lent, of Cologne.

Professor Soxhlet (Munich) spoke on the requirements of hygiene as regards milk, and laid stress on the importance of sterilizing milk for infants. In the debate that ensued, Professor Fraenkel, of Königsberg, declared that *all* milk should be sterilized, whether for infants or for adults. Professor Lehmann, of Würzburg, communicated the result of his investigation of the bacterial contents of different portions of fresh milk. He caused all the antiseptic precautions to be used. The first 300 cubic centimetres taken from the udder contained from 50,000 to 100,000 bacteria per centimetre, the second 300 contained about 5000 per centimetre, while the rest were almost altogether free from bacteria.

The second topic, sanatoria for phthisical patients, was introduced by Professor von Ziemssen's (Munich) assistant, Dr. Moritz, instead of Professor von Ziemssen himself, who was prevented from attending by the recent death of his son. Dr. Moritz held that the main elements in the treatment of phthisis are fresh air, good diet, and the avoidance of all harmful influences, all these advantages are generally much more easily attainable by sanatoria than at home. The existing sanatoria, he said, are of no use to the poor—that is, the enormous majority of phthisical patients; and therefore states, cities, sick funds, and philanthropists should combine to establish special hospitals for the poor. Meanwhile, such patients should be quartered in farm-houses and the like. (The assembly resolved to aim at the forming of societies for the establishment of sanatoria.)

The second meeting was held on the 18th, and began with a lecture on cooling chambers for meat and other provisions by Professor Hoffman, of Leipsic. He maintained that cooling by cold air is better than by ice, but that the best method yet invented is that by means of intensely cold salt solutions conducted through the cooling room in pipes. He summed up as follows: "Numerous articles of food sold wholesale are, in virtue of their composition, subject to rapid and early decomposition. In consequence of this there is a rapid diminution, soon amounting to utter loss of nutritive value, considerable financial losses by the merchant or increase of price for the consumer, and sanitary disadvantages, which appear either locally in the intestinal canal or throughout the whole system, owing to the formation and resorption of noxious substances. The best and cheapest method of preservation is the application of cold generated by suitable machines. Different kinds of provisions require different degrees of cold and moisture, in order to render the effect of cold practically available for wholesale and retail commerce."—*London Lancet.*

**Original Investigations on the Heating and Ventilation of School Buildings.**—The above is the title of an article by R. HARVEY REED, M.D., of Mansfield, Ohio. This interesting paper contains an elaborate account of Dr. Reed's statistics. His conclusions are as follows:—

"It seems to me that this investigation ought to settle, without a question, the problem regarding the location of the $CO_2$ in the school-rooms of to-day, and especially those which are heated artificially, and to prove, beyond a shadow of a doubt, that $CO_2$ is an omnipresent factor, in practically the same relative proportions at all levels of a school-room, whether ventilated at the top, sides or the bottom, or all.

"The next important question that confronts us, after having obtained all this 'array of facts and figures,' is, 'how shall we proceed to heat and ventilate our school-rooms in the most sanitary, economical, practical, and scientific manner?' In answer to these questions I will say:—

"1. That to heat and ventilate our school-rooms in the most *scientific* manner will require a system of heating and ventilation which will avoid the necessity of having either open doors, windows, or transoms, and which will at the same time supply each scholar with not less than 1000 cubic feet of fresh, warm air every hour, and which will remove a corresponding quantity of foul air at the same time, without subjecting any scholar in the room to an uncomfortable draught of either cold or over-heated air. Sufficient fresh, warm air should be supplied to each scholar at an average temperature of about 70°, and an average humidity ranging from 40 to 50; whilst foul air should be removed rapidly enough to prevent an accumulation of $CO_2$ to exceed 10 parts in 10,000 parts of air at any time, or in any part of the room, or a variation in the temperature between the floor and the ceiling to exceed 10° Fahr., or at any level of the same between the front and the rear, or either, to exceed 5° Fahr.

"2. To accomplish these results in the most *economical* manner will require an air warmer, with sufficient capacity to heat the required amount of air to the desired temperature without superheating it (for under no circumstances should it be allowed to pass over red-hot iron plates), and this fresh warm air should be discharged in a gentle current at the floor, and exhausted at the same level at the sides of the room, without the assistance of a top ventilator, or the aid of an open door, window, or transom. But if top ventilators *are* used at all, they should only be used to cool the room, in the event it became *over*-heated from any cause; outside of this they are of no value whatever, except to wantonly waste our heat and fuel, without giving us any advantages in return for their loss.

"3. I am fully aware of the fact, that it is usually a very difficult task to realize, in a practical manner the theories that fill us with enthusiasm when demonstrated on paper; and further, that there is perhaps *no* system of heating and ventilation in use at the present time that is capable of carrying out, in every particular and under all possible circumstances, the ideal heating and ventilating of the average school-room, yet, after years of investigation and examining scores of different kinds of heating and ventilating apparatus, without 'either fear or favor' to any one, I am thoroughly convinced that there is no system of heating and ventilating at the present time that will come so *near* fulfilling the requirements of the ideal methods of accomplishing these results, in the most sanitary, economic, practical, and scientific manner as the so-called Smead system. In making the above assertion I do so in all candor, and without personal favor, or intentional disparagement to any one, but simply as the legitimate conclusion I have derived from actual facts, obtained from repeated personal and scientific investigations."—*Reprint from Journal Amer. Med. Assoc.*, Sept. 12, 1891.

(A communication from Dr. Reed to the editors in regard to the "Smead System" will be found in an another portion of this number.)

**By-Laws and Regulations of the Province of Quebec, 1891.**—A. *Precautions to be taken when removing a patient suffering from a contagious disease.*—Remove all clothing, linen, coverings, or other effects of the patient, and replace them by others which have not been used since the beginning of his illness, or which have not remained in the room in which he has been isolated, unless, however, such clothing, linen, coverings, or other effects, after having been used by the patient or having remained in his room, have been disinfected in the manner described in schedule D.

Provide the patient with rags for receiving his expectorations or evacuations during the transport, and burn these rags or disinfect them according to one of the three methods described in schedule D.

B. *Disinfection of a house or apartment, and of the furniture and effects contained therein.*—1st Method: Close all outlets of the premises to be disinfected, then, fumigate with sulphurous acid by burning, for at least six consecutive hours, three pounds of sulphur for each 1000 cubic feet of space.

To have a successful disinfection, every aperture, hole, joint, etc., must be impermeably closed, and the windows so arranged that they may be opened from the outside, either by a string or by some other contrivance, after disinfection is completed. It must be borne in mind that sulphurous acid gas (vapor of burning sulphur), when inhaled in large quantities, is destructive to life.

To insure the combustion of the sulphur and as a precaution against fire, place the sulphur, either in powder or in small fragments, in an iron pan which should be placed upon a couple of bricks or stones in a tub partly filled with water. In order to insure the ignition of the sulphur, the surface should be well moistened with alcohol before applying the light. Several twisted slips of newspapers imbedded in the sulphur and projecting above the surface and ignited at their ends will answer the same purpose.

When the process of fumigation is completed, throw open all doors and windows, and air the house well, after which, sponge all exposed surfaces with a solution of carbolic acid (two ounces in each gallon of water), and give a final scrubbing with soap and hot water.

2d Method: Remove all the effects, furniture and articles contained in the premises in order to disinfect them in the manner described in schedule D, then, thoroughly wash the walls, ceilings, and floors with a solution of bichloride of mercury (1 drachm to a gallon of water).

C. *Disinfection of a vehicle or boat used in the removal of a patient, or of the body of a person who has died of a contagious disease.*—1st Method: Remove all cushions, curtains, and other accessories, and disinfect them according to one of the methods described in schedule D, then, wash out the vehicle or boat with a solution of bichloride of mercury: 2 drachms to one gallon of water.

2d Method: Put the vehicle in a closed place and fumigate with sulphur as described in schedule B.

D. *Disinfection of everything taken out of the room where the contagious patient is isolated.*—Food: Burn the remains of the food which has been served to the patient, or sprinkle them with a solution of carbolic acid or bichloride of mercury; or again sprinkle them with chloride of lime and bury them.

Vessels and utensils: Wash them in boiling water.

Clothing, sheets, napkins, coverings, and other linen: 1. Burn them, if of little value; or

2. Boil them in water for at least half an hour; or

3. Steep them for four hours in a solution of 1 drachm of bichloride of mercury to 1 gallon of water; or

4. Steep them for four hours in a solution of 1 ounce of carbolic acid to 1 gallon of water.

Furniture, mattresses, and articles which might be injured by the foregoing methods of disinfection: 1. Expose them for 10 minutes to a current of steam in a suitable apparatus; or

2. Expose them for two hours to dry heat at a temperature of 230 degrees Fahrenheit; or

3. If neither of the two preceding methods can be employed, put them

in a well-closed room, and expose to the fumes of sulphur, as described in schedule B.

Expectorations and evacuations: Collect them in vessels and mix with them one-half their quantity of one of the following disinfectants to be left in contact with them for half an hour:

1. Bichloride of mercury (2 drachms to 1 gallon of water);
2. Carbolic acid (4 ounces to 1 gallon of water);
3. Powdered chloride of lime;
4. Chloride of lime (6 ounces to 1 gallon of water);
5. Lime-milk prepared as follows: sprinkle gradually lime of good quality with one-half its weight of water, dilute the powder so obtained with twice its volume of water.

(Lime-milk keeps only for a few days, and only when the vessel containing it is kept carefully closed.)

E. *Disinfection of persons and effects before leaving a house which has been quarantined.*—Wash, at least, the uncovered portions of the body, the hair and beard, with a solution either of carbolic acid in the proportion of a tablespoonful to one gallon of water, or of bichloride of mercury in the proportion of one drachm to one gallon of water.

Completely change clothing, and put on other which has not remained in the infected house, or, if it has remained there, which has been disinfected in the manner described in schedule D.

F. *Disinfection of the patient and his effects after his recovery.*—Wash the body with one of the following solutions:—

1. A solution of a tablespoonful of carbolic acid to one gallon of water;
2. A solution of one drachm of bichloride of mercury to one gallon of water;

Disinfect, as described in schedule D, all clothing and other articles used by him since a period of 15 days before the beginning of his illness.

G. *Disinfection of the nurses.*—As described in E.

H. *Disinfection of the body of a person who has died of contagious disease.*—Wrap the body in a well-sewn sheet completely saturated with one of the following solutions:—

1. Bichloride of mercury (2 drachms to 1 gallon of water);
2. Carbolic acid (4 ounces to 1 gallon of water);
3. Chloride of lime (6 ounces to 1 gallon of water).

Put 2 pounds of chloride of lime in the coffin.

I. *Disinfection of a stable, inclosure, litters, excrements, blood, and other contaminated liquids.*—Stable: 1st Method: Close all outlets, then fumigate with sulphur as described in schedule B;

2d Method: Wash the walls, ceilings, and floors with a solution of bichloride of mercury—2 drachms to 1 gallon of water;

3d Method: Whitewash with lime the walls, ceilings, and floors.

Inclosure: Remove the earth to a depth of three inches and bury it at least a foot deep. Whitewash with lime the walls of the inclosure.

Litter, excrements, blood, and other liquids from the sick animal: Burn them, or bury them a foot deep, at least, after covering them with quicklime.

## OCCUPATION.

**Every day** in the year 17 persons are killed and 72 others are injured on the railways of the United States. This is the dreadful story told by taking the daily average of the railway casualties shown in the last annual statement by the statistician of the Interstate Commerce Commission. These figures include employés and passengers and also the many thousands of other persons (numbering in that year 3584 killed and 4200 injured) who meet their fate at street and road crossings or otherwise on railway tracks or trains, being neither passengers nor employés. But, deducting all these and the actual passengers, we still find that, on the average, every day sees almost 7 railway employés killed and over 61 injured.—*Railway Age*, November 29, 1891.

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## PUBLIC HEALTH.

**Some Startling Statistics.**—The thirty-fifth report of the Reformatory and Refuge Union states that in Great Britain and Ireland 145,000 persons are every year committed to prison as drunkards, of whom 112,000 are men and the rest women.

An English paper, from statistics taken from the press of the United Kingdom, reports the records of murders of women by inebriated husbands, since January 1, 1889, to January 1, 1891, to be 3004.

In a late debate in the German Reichstag it was stated that there are at present 11,000 persons in hospitals and insane asylums who are suffering from delirium tremens.

The police report states that the licensed houses in London, England, number 14,085, giving one to every 413 of the population.

Of the 30,000 criminals in German prisons, 14,000 were arrested for crimes committed under the influence of intoxicating drinks.

During the seven months of 1891 ending August 1st, California shipped to Eastern cities 6,094,616 gallons of wine, being an increase of 1,240,120 gallons over the shipments during the same period in 1890.—*Quarterly Journal of Inebriety*, October, 1891.

# THE CLIMATOLOGIST.

## A MONTHLY JOURNAL OF MEDICINE.

VOL. I. JANUARY 15, 1892. No. 6.

### FOREIGN COLLABORATORS.



### "INTRODUCTION.

"The object of this JOURNAL is to promote original investigation, to publish papers containing the observations and experience of physicians in this country and Europe on all matters relating to CLIMATOLOGY, MINERAL SPRINGS, DIET, PREVENTIVE MEDICINE, RACE, OCCUPATION, LIFE INSURANCE, AND SANITARY SCIENCE—and in that way to supply the means by which the general practitioner and the public at large will become better acquainted with the diseases of this country and Europe, and better armed to meet the requirements of their prevention or cure. The study of these subjects in this country is exciting great and increasing interest, and all admit that, from the little knowledge already possessed of its resources, possibly every known combination of atmospheric condition, soil, altitude, climate, or mineral springs, is to be found on this continent. It is confidently expected that *a journal devoted to the study of all diseases into which climate, soil, race, occupation, hereditation, diet, contagion, etc., enter more or less as factors*, will receive the encouragement of all, and become eventually an authority upon all subjects which are included in its title, although a thorough review of all progress in the departments mentioned will not be neglected. Especial attention will be given to the publication of *original material*, and it is to be hoped that physicians of all sections of the country will send papers upon any subjects which will be of general interest—such as the diseases of their locality—those incident to occupation, race, or climate, the study of epidemics, the questions of proper food, of the water supply, its potability and distribution, and all matters relating to drainage and diseases dependent on it.

"Original papers based upon experimental studies, or laboratory investigations in bacteriology, will form a prominent portion of the material presented during the year.

"Special attention will also be paid to the subject of health resorts, descriptions of Sanitariums with special reference to their suitability to certain cases, and the proper selection of patients to be benefited by different resorts. The utmost care will be taken that this JOURNAL shall assume and maintain the highest scientific character. It will be absolutely independent in its principles—*fair towards all*. It will depend for its maintenance upon the support given to it by the profession, as it is not published in the interest of any special section or clique."—*August*, 1891.

# THE HISTOLOGICAL CHANGES WHICH TAKE PLACE IN THE LUNGS IN CURED PHTHISIS PULMONALIS, AND THE INFLUENCE OF DIATHESIS IN THE DEVELOPMENT OF SUCH CHANGE.[1]

By ALFRED L. LOOMIS, M.D., LL.D.,
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GENTLEMEN: That a process of healing is developed in the lungs of a certain proportion of phthisical subjects seems well established by a large number of well-authenticated phthisical histories, and the possibility of such an occurrence has long been accepted by our best clinical observers; but the histological processes in such recoveries have not been sufficiently studied in the light of recent advances in the etiology and pathology of tuberculosis.

The observations which I shall present on this subject are based on the records of 524 post-mortem examinations made in the Bellevue Hospital dead-house on persons dying of non-tubercular diseases, which were collected and analyzed by Dr. H. P. Loomis. The lungs in 8 per cent. of this number presented changes which I shall describe as local evidences of cured tuberculosis. This is the highest ratio of recoveries from pulmonary tuberculosis, based on post-mortem records, given by any observer except Vibert, who states (in the London Lancet) "that at the Paris Morgue he found in 17 of 131 persons dying from violence or sudden death the evidences of pulmonary tuberculosis which had been cured." The first question that meets us in these investigations is, *What* are the lesions which may be regarded as evidence of cured phthisis? Pathologists have long regarded patches of induration at the apex of the lungs as indications of the previous existence of active phthisical processes;

[1] Read before the American Climatological Association at Washington, September 23, 1891.

but such patches present none of the special histological characters of tuberculosis, and might have been developed by other causes of local irritation than tubercle. Until the discovery of the tubercle bacillus it was impossible to determine with absolute certainty when masses of fibrous tissue were found in the lungs whether the antecedent affection had or had not been tuberculous.

The gross appearances of the lungs of the 44 cases included in these records were as follows:—

In 38, the apex of the affected lung was found firmly adherent to the costal pleura, with more or less puckering and depression of the adherent surface. On section, from one to ten fibrous nodules were found scattered through the lung apex, varying in size from a few lines to an inch in diameter. These nodules, in most instances, were situated just beneath the depressed adherent surface, and were continuous with the thickened pleura. A few were found situated in the central portion of the upper lobe, and were connected with the pleural surface by dense bands of fibrous tissue. In the central portions of the larger nodules, soft cheesy or calcareous masses were usually found; a few contained no cheesy or calcareous matter. In six instances, small closed cavities, lined by a thick, dense, fibrous membrane and containing a soft, cretaceous material, occupied the centre of large nodules. A linear cicatrix was found in a few nodules marking the site of a healed cavity. Immediately around many of the nodules were lamellæ of less dense fibrous tissue, which was often traversed by contracted, obliterated, and dilated bronchi and impervious bloodvessels. In the immediate neighborhood of the nodules, while the lung tissue appeared normal, it was found more or less emphysematous. In two instances, the entire upper lobe of the lung was transformed into a homogeneous fibrous mass. The fibrous tissue composing the nodules was more or less deeply pigmented. In all of the 44 cases, careful studies were made of sections from the nodules and the lung tissue surrounding the nodules. In these sections more or less completely organized fibrous tissue was the prominent histological change. In many, at the edge of the tissue destroyed by the tubercular process, new connective tissue could be seen just developing, and it was evident that the fibroid processes originated in one of three ways:

*First.* By round-cell infiltrations of the interlobular connective tissue, so that often the interlobular septa was increased tenfold. *Second.* By round-cell infiltrations of the alveolar walls. In one section adjoining a contracted and encapsulated nodule, the alveolar walls were seen in all stages of fibroid development from round-cell infiltration up to fully organized fibrous tissue. *Third.* By round-cell infiltrations around the vessels and bronchi, which became contracted and obliterated by the fully developed fibroid growth. In some sections pleuritic fibrosis seemed to be the first change, and in all lines of fibroid tissue could be traced from the nodules to the pleura. There was no evidence in any section that the tubercular tissue itself furnished the fibroid development, but the fibroid processes were developed in the normal connective tissue in such a manner as to obliterate the avenue of tubercular infection. This corresponds to Ziegler's statement "that the arrest of tuberculosis can only take place when the inflammatory process issues in the development of fibrous tissue." One condition was so constantly present as to lead to the conclusion that it was an essential condition, viz., a condition of intense hyperæmia which always surrounded the tubercular areas where recent fibroid processes were active. The fully developed fibroid masses were also found studded with new capillary vessels. It was impossible in any of the sections to make out the different elements which enter into the composition of tubercle. In some a few giant cells could be made out. A large number of sections were stained for tubercle bacilli, but they could be detected in only one or two.

Inoculative experiments upon animals, conducted in the "Loomis Laboratory," by Dr. H. P. Loomis, to determine whether tubercle bacilli were present in the larger nodules which, containing cheesy deposits, gave the following results:—

Twelve healthy rabbits were inoculated under antiseptic precautions, with 2 cc. of a fluid obtained by dissolving the contents of the larger nodules removed from twelve different lungs. Of these, five were proven to contain bacilli by the development of tubercular lesions in the inoculated animals. The remaining seven gave negative results. In no one of the animals in which localized tubercular lesions were developed was the infection sufficiently intense to produce general tuberculosis. It is quite possible, in fact it is probable, that, if the contents of all the nodules found in those lungs which gave negative results had been tested by inoculation experiments, tubercular lesions would have followed the inoculation in a much larger proportion.

From these histological studies it seems evident that the only way in which the arrest of tubercular processes in the lungs can be accomplished is by the development of fibroid processes in and around the tubercular areas, and the question arises why do these reparative processes occur only in a limited number of tubercular subjects? I am convinced that the answer to this question is to be found in the diathetic tendencies of different individuals. In one person the tendency to fibroid development is above the normal of systemic harmony. In another, rapid parenchymatous cellular developments occur under purely physiological stimulus, and become excessive under pathological. We call these conditions fibroid and strumous diathesis. It is, however, important to remember that fibroid processes which are injurious under some conditions may become directly conservative under others, and two opposing diatheses may result in the relief or cure of diseases produced by one or the other, the result being obtained by the very intensity of the diathetic condition.. Whenever necrotic changes occur in the parenchymatous tissue, fibroid development is the only method of repair; but when the cause of the necrosis is especially powerful, only a pathologically strong fibroid activity will suffice for its arrest. The histories of many cases of pulmonary tuberculosis afford striking proof of this antagonistic action of diathesis. I have long been convinced that there is a relative immunity possessed by arthritic individuals, not only against pulmonary, but against all forms of tuberculosis, and I have made many observations which appear to me to prove that in a patient whose parents suffered from general fibrosis, or who presents active evidences of this diathesis, tuberculosis of the lungs, bones, joints, and glands shows a marked tendency to assume a chronic course and to a spontaneous cure. This relative immunity against phthisis possessed by individuals with a fibroid diathesis, and their power to resist tubercular processes when they have once become established, apart from the biological and chemical aspect of the question, no doubt rests on the basis of the antagonism of diathesis. The following briefs of typical histories illustrate this conservative diathetic antagonism in a very striking manner:—

CASE I. is an illustration of the inhibitory influences of gout over progressive phthisis.

Female, æt. 47. Father suffered from gout, with great deformity and chalky deposits in the joints for many years, and died at 63 years of renal and cardiac disease; mother died of phthisis at 60. Patient was always delicate; at the age of 44 she was taken with acute pulmonary symptoms, lost flesh and strength rapidly, and extensive infiltration occurred at the left apex; laryngeal symptoms accompanied the pulmonary infiltration, attended by complete aphonia; her laryngeal disease was diagnosticated by several expert laryngologists as tubercular. When she first came under my observation she presented the symptoms of advanced phthisis, with signs of cavity at the left apex. After a residence of several months in the Adirondack Mountains her phthisical symptoms began to improve and arthritic symptoms manifested themselves—the small joints enlarged and showed chalky concretions. For the past three years the pulmonary disease has steadily retrograded. The laryngeal symptoms have subsided and her larynx now presents a normal appearance. Dry tubular breathing is heard at the left apex; there is little cough and no expectoration. The general health is good, except the gouty symptoms and the joint deformations. The heart is hypertrophied, and the arteries are hard and show tension, the urine is constantly loaded with urates.

CASE II. illustrates phthisical arrest in a young person with arthritic symptoms. Male, æt. 25. Father, gouty; mother, healthy. Patient, after losing flesh and strength for three months, had a profuse hæmoptysis, followed by fever, cough, expectoration, rapid emaciation, and the usual symptoms of rapidly-progressive pulmonary tuberculosis, with extensive infiltration of the right apex. Six months after changing climate and habit of life, his phthisical processes seemed arrested and his general condition slightly improved. Suddenly he was attacked with acute arthritic symptoms, which confined him to bed for six weeks; his convalescence from his arthritis was slow; several of his joints became stiff, which compelled him to use crutches for several months, during which time his pulmonary symptoms subsided, and after a year he had apparently entirely recovered. Physical examination of his chest now gave only tubular breathing and dullness at the right apex; no moist sounds. His arthritic symptoms remain, with permanent crippling of the knee-joints; his heart is hypertrophied; his arteries are hard and give the evidence of high tension.

CASE III. illustrates the effect of the development of cardio-vascular and renal fibrosis in arresting phthisis in one with a strong fibroid heredity.

Female, æt. 58. Father and three of her brothers, after developing cardio-vascular disease at about 40, died of apoplexy, between 50 and 60; mother died of phthisis. Her three brothers, now living, have gout, with large hearts and hard arteries. At 38 she was seized with a profuse pulmonary hemorrhage, without any premonitory symptoms. Two years afterward, while taking care of a daughter who died of acute phthisis, she had a second hemorrhage; lost flesh rapidly, and developed the usual symptoms of progressive phthisis. Prof. A. Clark at that time found the evidence of a cavity at the left apex, and by his advice she took up her residence in Sullivan County, N. Y. Gradually her phthisical symptoms subsided, and she developed well-marked gouty symptoms, with deformity of her joints. As her arthritic disease manifested itself, her pulmonary symptoms subsided, and she gained flesh and strength. Two years ago she consulted me for dyspeptic symptoms. I found her heart extensively hypertrophied and her arteries hard and tortuous. Urine abundant; specific gravity, 1006; no albumin or casts.

At the apex of the left lung the thoracic wall was depressed, the percussion was amphoric; amphoric breathing and amphoric whispers were distinctly heard; there were no moist sounds; during the past six months she has suffered from attacks of dyspnœa, and albumin has appeared in her urine.

CASE IV. is an example of arrested phthisis in one in whom cardio-vascular disease was associated with lead-poisoning. Male, æt. 55. Father and mother died at 75 and 78. There is no hereditary tendency to disease. He is a painter by trade. At 33 he had phthisical symptoms, from which he recovered and remained well until his 45th year, when he had repeated pulmonary hemorrhages, with extensive infiltration at the apex of the left lung. For two years he presented the symptoms of slowly-progressive phthisis, until he was thought by his physician and friends to have passed the possibilities of recovery. He then took up his residence in Western Virginia, and gradually regained his flesh and strength, and lost his cough. He now began to show the evidences of lead-poisoning, and soon after cardiac symptoms became so urgent that he was compelled to give up all physical labor. He never had any gouty or rheumatic symptoms, and led a temperate life. A physical examination revealed a dry cavity at the left apex, with extensive cardiac hypertrophy, hard and tortuous arteries, small liver; urine abundant, specific gravity 1010, a trace of albumin and hyaline casts. Slight physical exertion brings on severe attacks of dyspnœa.

Of 70 cases of cured phthisis which have been under my personal observation 52 have presented well-marked evidences of general fibrosis, and Dr. E. L. Trudeau reports to me from the records of the Adirondack Sanitarium 21 cases of recovery in which arthritic fibrosis existed either in the parents or in the patients themselves. From a study of the histological changes, which I have presented as taking place in the lungs of those who have recovered from pulmonary tuberculosis, in connection with the histories of those that have recovered under my personal observation, I am better able to understand how a predominant hereditary tendency to general fibrosis becomes an important factor in such recoveries, and necessarily leads us to the conclusion that the prognosis in tuberculosis must be largely influenced by the diathesis and family history of the phthisical subject. Since the discovery of the tubercle bacillus many, in an *ex cathedra* fashion, have ignored the influence of diathesis and heredity in phthisis, and have proposed to class phthisis in the list of purely infectious diseases. That the tubercle bacillus is the exciting agent in all tubercular processes, our present knowledge leaves no room for doubt; but we must search in long-recognized and well-established constitutional influences for an explanation of its different behavior in different individuals. It is not enough to say that a youth of nineteen or twenty with a strong hereditary strumous diathesis develops his acute phthisis because of a more intense infection, or because the bacillus has entered his body by more direct lymphatic or vascular channels; but the explanation is rather to be found in the fact, that he has no antagonistic diathetic tendency to put in motion processes which shall throw out barriers at the seat of the primary infection, which will prevent the bacilli from entering those channels which allow of rapid and extensive tubercular infection. I am confident that if Koch's tuberculin has any power in arresting tubercular processes, it will be found to be due to its exciting around and within tubercular areas inflammatory processes which favor the development of fibroid processes.

I offer these incomplete studies with the hope of stimulating a more extended observation in the lines which they suggest.

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## *DISCUSSION.*

Frank Fremont Smith, M.D. It is, perhaps, interesting to remember that the work of Prof. Lannelongue, a French surgeon, mentions the fact that he injected chloride of zinc around tuberculous joints producing increased connective tissue formation, thus quarantining tuberculous masses.

A. Jacobi, M.D. If there be time, I should like to report what I have seen in those cases.

I have seen the cases of Lannelongue. I have been standing by his elbow and have seen every one of those cases he presented to us. It was about six weeks ago, during the second session of the Congress of Tuberculosis, the first having taken place three years ago; one of the features of it was the presentation of those cases.

The injections into the joints were made with a ten per cent. solution of chloride of zinc, the object being to produce a cure by throwing out, as Dr. Loomis says, new tissue. There were fifteen or twenty patients, children aged from two to seven or eight years. In all of them, we are told, injections had been made, some only two or three weeks previously, and some five or six weeks. Every one of them was well, so we were told. I have the greatest respect for Dr. Lannelongue's studies, accomplishments, and zeal, but I have some also for my own eyes. In a number of cases when their joints were pressed and moved there was no pain. Some walked well, but we may as well not forget that patients with sore joints, when resting and fed in a hospital, are apt to improve. A tubercular joint ought to have more than a few weeks to prove that it remains well. In the short time of an exhibition nobody but the lecturer could make an examination. Nobody else could examine or did examine them but himself. In most cases he removed the covering or dress and examined the joints by touching them, etc. And I will here state what I know, that a number of those children had very great pain on being touched or moved. I do also know that those children were snatched from the table and hurried off, and were told that they were naughty, bad children, and they would not have any chocolate; that was the last of those children; I do not say that those children were not "well." I do say, however, that those children still had swollen joints, and that they had very acute pain when they were touched; that they were taken from the table and hurried to their rooms, and that they did not get any chocolate. Those who were well, or without pain, behaved well because they *were* well. They got chocolate.

Now that is what I have seen, and therefore I conclude that we had better wait for the effect of this medicine, when given in promiscuous cases.

H. F. WILLIAMS, M.D. Somewhat in the line of Dr. Loomis's conclusions are the old and well-tried deductions of Dr. Churchill in regard to the use of hypophosphites. Chalky deposits are concomitants of rheumatic gout, and people living in lime and hard-water districts suffer from nephrolithic affections. The calcareous deposits in degenerated lungs are said to have been produced by long-continued use of lime, soda, and potash salts, and around such deposits there is always more or less fibrous degeneration. If it be a fact that gouty and rheumatic diathesis favors the development of a conservative fibrosis, then an artificial diathesis, by the use of the hypophosphites, should do the same thing. This might seem to confirm Dr. Loomis's impressions concerning the immunity from phthisis of gouty and rheumatic subjects.

ALFRED L. LOOMIS, M.D. The object of my paper was stated in the last few words to direct observations in the line which I hoped it would suggest. I did not claim that subjects would recover from phthisis by the use of arsenic. I only claim that in those cases of cured phthisis which have come within my observation very nearly two-thirds either presented, during the active progress of the phthisical processes or afterwards, arterial fibrosis; and that if phthisis is cured only by the development of fibroid processes in and around tubercular areas—if that is always the way in which cure takes place—it seems to me that anything that acts favorably on the development of fibroid processes would tend to the arrest and cure of pulmonary tuberculosis.

I would like to say a word about creasote, as I fear I shall not be here when the paper on that subject is read. I think my friend, Dr. Robinson, deserves a great deal of credit for recently directing the attention of the profession to the use of creasote in the treatment of phthisis. I remember that twenty years ago creasote was used exclusively in phthisis in connection with ferrous acids, but I have never obtained any specific effects from its use upon the phthisical processes. I am quite certain that it has no effect upon the tubercular bacilli or upon the tissue around the tubercle.

It seems to me to act simply to improve the digestive power of the patient and to arrest intestinal fermentations.

A. JACOBI, M.D. I beg the Chair's pardon for again taking the floor, but the subject is so important, and, at the same time, so interesting, that some remarks may be permissible.

Every medical study of any kind, if it be considered to be legitimate, must be conducive to the prevention of disease or to the healing of the sick. The observations made by Dr. Loomis correspond in many points with observations that have been made before, but never better elucidated than by him, and they lead me to the suggestion that if we mean to cure we must contribute something to rendering bacilli innocuous. Dr. Loomis himself suggests that if we are to do anything in that line it must be accomplished by improving the chances for the formation of fibrous tissue.

Many of us have expected, some time ago, that tuberculin would have that effect. It appears to be the general impression now that when a small injection is made slight irritation results; when the injection is large there is so much congestion that not infrequently new inflammation will make its appearance, and hence the process goes on more quickly than if left alone. If we had safe means to produce fibrous tissues, we should thereby certainly contribute to the cure of local tuberculosis. Now, there are such means. If we have remedies that are tissue-builders, that means that they contribute to the formation of connective tissues. We know that some remedies exist having that property. They are arsenic and phosphorus. Both will irritate and contribute to the building of new connective tissue. Both will, though being vascular irritants, build up in small doses, destroy when given in large quantities. For twenty years and more I have used minute doses of phosphorus (not, however, the phosphates), for the purpose of more rapidly producing connective tissue in subacute and chronic cases of bone disease. In a large number of cases I feel positive that I have seen successes in a relatively short time. It is known that Wegner accelerated the formation of callus in fractures (experimentally), by such doses of phosphorus.

For the last twenty years or more I have used arsenic in pulmonary diseases with the intention, and I believe the effect, of increasing the amount of connective tissue. If so, the result must be that tubercles are encysted and thereby rendered innocuous. During that period I have treated almost every case with arsenic, frequently combined with digitalis among other things, and the result has been very fair. Phosphorus I have not used for that purpose.

R. G. CURTIN, M.D. I was the observer of some experiments made by Dr. Pepper in Philadelphia about eighteen years ago, in which he injected the tincture of iodine into and around pulmonary cavities. This appeared to cause some local disturbance, which was probably followed by induration around the cavities causing contraction. I have no doubt that this treatment hastened the fibroid process. Some years afterwards I was fortunate enough to be able to see the post-mortem appearances in three of these cases, which exhibited the peculiarities or characteristics spoken of by Dr. Loomis. Probably the benefit which was derived in some of the cases are described by Dr. Loomis in his very able paper.

J. H. TYNDALE, M.D. I was delighted by Dr. Loomis's insisting on diathesis as a basis of cure, especially as to the rheumatic diathesis. Constructive and destructive metabolism I think would be more expressive terms to designate the individual tendency instead of fibrous and scrofulous. Constructive or destructive metabolism is inherent in the person.

# FURTHER CONSIDERATION OF THE ANALYSIS OF RECORDED CASES OF PHTHISIS PULMONALIS.[1]

By S. A. FISK, M.D.,

DENVER.

In the summer of 1889 I presented to the Colorado State Medical Society an analysis of one hundred recorded cases, showing the effects of the climate of Colorado upon cases of phthisis pulmonalis, from which analysis I drew the following conclusions: "Taking cases as they come to us, we can expect improvement in two out of three; that men do better than women, as in fact they do anywhere; that persons over twenty years of age do better than under twenty, and that over thirty years of age do still better; that heredity, however, is no bar to a person's coming to Colorado, but that the more indirect the inheritance the better are his chances. Nor should a hemorrhagic tendency debar one from coming, as such cases do admirably well; that altitude *per se* is not a producer of hemorrhage; that the chances of obtaining an arrest of the trouble are improved by the patients possessing a sound digestion, a good appetite, and a pulse and temperature not much raised above the normal; and that patients in the early stages of the disease, especially if their digestion be sound, appetite good, and pulse and temperature nearly normal, are the fittest subjects for our climate, whether they have any hereditary tendency or not."

Very singularly my conclusions were corroborated by Dr. Solly, of Colorado Springs, in an article read before this association at its last annual meeting. From the analysis of one hundred and forty-one cases, coming under his observation, he likewise concluded that two out of three cases coming to Colorado received benefit, which result was all the more gratifying, as his work was entirely independent of mine.

[1] Read before the American Climatological Association at Washington, September 23, 1891.

Two years and three months have now passed by since I made my report, and it is my wish at this present time, so far as I am able, to bring my report down to date; an undertaking which I approach with some hesitancy, because of a dread that, after all, however conscientiously I may analyze the cases, my results may not do full justice to the curative effects of the Colorado climate.

At the time of my previous report I concluded that, of my one hundred cases, fifty per cent. were very much benefited by our climate; that there was seventeen per cent. additional of persons who showed improvement, although not equal to that of the first class; making in all, as it seemed to me, sixty-seven per cent. of cases that received a benefit by coming to Colorado. Of the remaining thirty-three cases twenty-six had died, and seven seemed to be positively worse than they were on coming. The intervening time of two years has simplified matters somewhat for me, as, so far as I have been able to follow the cases, I see either a positive improvement or a positive retrogression. Out of my one hundred cases, at the time of my present report, I know of forty-three deaths. There are twenty-four additional cases of which my knowledge does not extend up to date, leaving me with thirty-three now living, of whose condition I can speak with a certain degree of assurance.

If, now, we take the thirty-three cases, I find that thirty-two of them are so much improved that they have been able to take up the burdens of life again, either in Colorado or in their former locations, and so might fairly be classed under the heading of cured, according to the definition of Williams and other writers. The remaining one case is in a somewhat worse condition than when he came to Colorado, he being amongst the class that I formerly spoke of as somewhat improved; but, to offset his condition, I find that one whom I formerly classed as worse, is to-day very much improved.

Of the thirty-two, whose condition is improved, ten are now living at or near sea-level, and, so far as I can learn of their condition, are not showing any recurrence of symptoms, or experiencing much inconvenience, a fact which is of exceeding interest as demonstrating a point on which the profession is as yet divided, namely, with reference to the advisability of patients who have received an arrest of their trouble in Colorado, returning to lower elevations. It hardly seems fair to me to class all of the thirty-two as cured, for, despite the fact that they are actively engaged in the duties of life, in some instances there are yet remaining cough and physical signs. Six of my list can be classed under this head, who, though able to work, are nevertheless occasionally subject to a recurrence of their symptoms, and at all times have to exercise a certain amount of caution. The remaining twenty-six, it seems, can be fairly spoken of as cases of cured, cases in regard to whom most persons would scarcely presume that they had ever had any pulmonary trouble, and who are able to go about their duties like other men.

If then we speak of twenty-six per cent. as the ratio of cured to be obtained from a residence in Colorado climate, it seems to me that we would hardly be doing the climate justice, inasmuch as some of the cases that have passed from our observation were, at the time they were last seen, such as might be fairly classed under the heading of cured. Of this number I can now recall six, which will bring my percentage up to thirty-two per cent., a ratio which I find is again confirmed by Dr. Solly's experience, as stated in his report to the Colorado State Medical Society, at its last annual session, and which is furthermore in accord with the results recorded by others, as the ratio of cures that may be expected from treatment in high altitude resorts.

In passing it may be permissible for me to state that of the twenty-four cases that have passed from by observation, I regarded the condition of twenty-two as very much improved, when last seen, and of six as so markedly improved as to warrant a return to their homes, and hence I have spoken of them as cured. So, if I should add these twenty-two cases to the thirty-two now under observation, and whose condition is very markedly improved, it would bring my percentage of benefited cases up to fifty-four, which, while it is somewhat less than the percentage which I had obtained on a previous analysis, will probably come nearer a fair statement of the case.

Of the forty-three who have died, two were doing remarkably well until attacked with an intercurrent disease which carried them off, leaving forty-one cases that in my best judgment died of their pulmonary trouble.

An analysis of the forty-three cases shows the following results, which, it seems to me, will convey some impression of the effect of the climate of Colorado upon pulmonary trouble, and, in a somewhat negative way to be sure, will illustrate the class of cases that are suited to this climate.

With reference to the sex of patients, I find that of my one hundred cases fourteen were women, and of these eight died, leaving six unaccounted for but much improved. Of these, three are to-day living in the East and doing very well; one is in Colorado apparently cured of pulmonary disease, and two I have lost sight of. To reduce this to a percentage, it makes about fifty-seven per cent. of the female patients who have died, as against forty per cent. of the male; seeming to indicate, as my previous analysis did, that women do not do quite so well in this climate as men do, a result which probably will hold wherever pulmonary disease is treated.

With reference to the age of the patients, of the forty-three who have died three were under twenty years of age, making a percentage of one hundred of all my patients under twenty at the time of my first examination.

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|---|---|---|---|---|---|---|---|---|
| Of those | between | 20 and 30 | there were | 20 | deaths, | a ratio of | 37.7 | per cent. |
| " | " | 30 and 40 | " | " 15 | " | " | 46.8 | " |
| " | " | 40 and 50 | " | " 4 | " | " | 50 | " |
| " | over | 50 | " | was 1 | death, | " | 25 | " |

which leaves me to infer that patients have a greater recuperative power and do better if the disease takes them between twenty and thirty than if it comes upon them when they are between thirty and forty, and that they do better in that decade than they do between forty and fifty; in other words, that under twenty they do not do well, and between twenty and fifty the chances diminish as they get older, a result which is not altogether in accord with my previous observations.

With reference to the question of inheritance, I find there were ten in whom there is a history of one or both parents having been affected with pulmonary trouble, one who had one or both grandparents affected, three who had uncles or aunts, seven who had brothers or sisters, and twenty-two in whom there was no history of inheritance: which goes to show that of the forty-three deaths twenty-one had a history of inheritance and twenty-two had not, making it about fifty per cent. in each case.

If now we compare the results with the full table of one hundred cases, I find that of the cases who had a history of inheritance when they came under my care, 40.7 per cent. of them died; whereas, of the cases who had no history of inheritance at the time of coming under my care, 45.8 per cent. have died, a result which goes to confirm my previous observation that heredity is no drawback to a person's coming to Colorado.

As regards hemorrhages. Of my total number of one hundred cases forty-four had a history of having had one hemorrhage or more previous to coming to Colorado. I find that of the forty-three deaths, ten of them can be directly attributed to hemorrhage, and of these ten it occurred in two cases where there had never been any previous history of hemorrhage. This would make a percentage of 18.6 of such persons who came to Colorado with previous histories, which goes very conclusively to prove the statement made in my previous article, that this climate is not a producer of hemorrhage, and that, contrary to a somewhat general belief, hemorrhagic cases do admirably well here, a result which is confirmed by the observations of Dr. Jacob Reed, Jr., of Colorado Springs, as is outlined in an article read before the Colorado State Medical Society several years ago.

I find that of the forty-three cases who have died, in eleven the appetite is stated as having been very good, fair in another eleven, and positively bad or wanting in twenty-one. The digestion was very much impaired in twenty, and the action of the bowels irregular in fifteen, which would lend some credence to the belief that the condition of the patient as regards perfect or imperfect assimilation is a very considerable factor in the prognosis, those doing best where the appetite is good, the digestion perfect, and the bowels regular; and, on the other hand, those doing poorly where the appetite is wanting and digestion imperfect.

As regards pulse and temperature of the forty-three fatal cases, there were twenty-three in whom the pulse ran from 100 to 130 per minute and whose temperature was from 100° to 104.2° at the time they first came under my observation. In six of the cases the records are wanting, whereas of the remaining cases the temperature and pulse varied but slightly from the normal, showing that irritability of temperament, as indicated by temperature and pulse, is an unfavorable indication with reference to prognosis.

With reference to the condition of the lungs at the time of coming under my observation, I find that of the forty-three cases, thirteen may be classed as having been in the first stage of the disease, nine in the second, and twenty-one in the third, a result which is in accord with the usual experience that high altitude treatment is better adapted to persons in the earlier than the later stages of the disease, especially if the slight amount of trouble be accompanied by good digestion and very little nervous irritability, as shown by the temperature and pulse.

The results as a whole, it seems to me, can fairly be taken as corroborative of the conclusion that I drew from my previous analysis, which conclusion I have quoted at the opening of this article.

## *DISCUSSION.*

J. H. Tyndale, M.D. I would like to hear further about the deaths from hemorrhage. Dr. Fisk speaks of twenty-two per cent. of his cases having died from hemorrhage, which seems so remarkable that I would like to know whether he attributes those deaths to hemorrhage directly and immediately, or whether death was in consequence of many hemorrhages, or how.

S. A. Fisk, M.D. I shall have to consult my tables again to fully and accurately answer Dr. Tyndale's question. I recall one patient who died of hemorrhage and was found after the intermission of a night; but my cases are not all of that character. They include those as well where, I think, the hemorrhage led indirectly to death, as the patients never seemed to revive after the hemorrhage. In such cases the patients seemed to be doing pretty well up to the time of the hemorrhage, but from that time they ran down quite steadily, never again recovering. I have included those cases, so far as I could judge, in my tables.

# "REST CURE" IN THE TREATMENT OF INCIPIENT PHTHISIS.[1]

By JOHN M. KEATING, M.D.,

COLORADO SPRINGS, COL.

Formerly Consulting Physician for the Diseases of Women, St. Agnes' Hospital, Philadelphia; Consulting Surgeon to the Maternity Hospital; Gynæcologist to St. Joseph's Hospital; Visiting Obstetrician to the Philadelphia Hospital (Blockley); and Lecturer on the Diseases of Women and Children, etc.

Your kindness in asking me to appear before you with a paper reminds me that my audience is composed of men learned in the science of that branch of medicine treating of pulmonary diseases, that I am addressing a body of specialists, whose experience and knowledge are far greater than my own, and yet it is just because you are such, that I have chosen for my theme a matter relating to the treatment of our pulmonary phthisis, more especially in women, with the hope that you will agree with me in my conclusions and recommendations, and thus with your backing my words may have greater weight.

For one year I have lived here, and in daily intercourse with many of my hearers. One cannot thus be associated with men of large practice and keen observation, and fail to benefit by such experience. I have learned that you all believe that the treatment of pulmonary phthisis is summed up in the endeavor to establish and perfect nutrition—that nutritive processes must be encouraged—that debilitating influences must be abolished—that nutrition must be brought about and maintained.

I have learned that fortunately the Almighty has given us much more lung tissue than we actually need for the ordinary avocations of life, and that therefore the hope which buoys the consumptive is not to be considered as an effort on nature's part to establish euthanasia, but is in reality an incentive to influence both patient and doctor to extraordinary efforts to arrest destruc-

[1] Read by request before the El Paso County Medical Society.

tive metamorphoses, and to re-establish nutrition. Our means may vary; our end in view is the same.

But a very small percentage of the community can avail themselves of what you and I consider a most valuable element, namely, climatic treatment; and yet do all those who comprise the list of fortunates get its full advantages? We are often surprised to see the furor created by the publication of some special measure, called "specifics" by the laity, but readily recognized by us, when we come to investigate, as a means directed either to the arresting of destructive processes or to increasing nutrition, or both. A true specific for phthisis, namely, a guarantee for a perfect cure and no return, is as far off to-day as it will be a hundred years hence. But this subject has been so well treated recently by Dr. Von Ruck, in his able paper in the November number of the Journal of Dietetics, that I need not dwell longer upon it in general, but will simply give you my views by which our patients can be benefited.

In 1877 I had charge of a patient who had placed himself under the care of Dr. S. Weir Mitchell. The history of the case is given fully in Dr. Mitchell's book, "Fat and Blood," page 149, 6th ed., and I will here only give a review of it. P. D., male, aged 53, after thirty years of close confinement to business, and a worrying business it was, broke down in health. When examined "he was sallow, emaciated, and coughed every few moments. He had night-sweats, nervous twitching and slight dulness on percussion at apex of right lung, with prolonged expiration and roughened inspiration and some increase in vocal resonance." He was given the "rest cure," and the result was as follows: "May 6th, Mr. D. weighed in heavy winter dress one hundred and twenty-five pounds; June 20th, in light summer garb he weighed one hundred and thirty-three pounds; in August, his weight rose to one hundred and forty pounds, and he has continued to gain. When last I saw him, a year later," writes Dr. Mitchell, "he was strong and well, had no cough, and had ceased to be what he had been for years—a delicate man."

There is no doubt to my mind that bacilli could have been found in his expectoration had Koch and Ehrlich given us then their wonderful studies; nevertheless, the man's recovery was remarkable. Had he maintained his nutrition, he probably would have lived to this day, but presuming on the perfection of his cure he overtaxed himself and finally succumbed to phthisis, as so many do.

Many a time, while I assisted Dr. Mitchell, I thought that some of the emaciated, anæmic women to whom I gave the electricity, and whose recoveries were marvellous, had been saved by his treatment from a phthisical future, but physical signs gave no evidence of local disease, and in those days, of course, sputum examination was unknown; nevertheless, Dr. Mitchell was conservative enough not to arouse hopes that might be vain, and he thus writes in his book, page 161 :—

"I have ventured, without much hope, to treat three cases of phthisis in the same manner. There are cases of this nature in which exercise wearies; there are others which we cannot for various reasons send away to more genial climates; and in such instances we are driven to stand by, and with no more hope than oil and tonics give, merely watch the slow decline of our patients. I believe that sometimes, and especially in the very earliest stages of consumption, my treatment will save a small percentage of such people; but as yet I only venture to make the suggestion, and wish distinctly to state that my experience in this form of its usefulness is limited.

"One of the cases treated got well and remained well. There was every evidence of pulmonary trouble. A second improved enormously in all respects, but relapsed hopelessly, owing to a large and repeated bleeding from piles and rectal fissure. The third, a male, æt. 24, was treated by rest and massage without electricity, and improved so as to resume his work. He still has slight cough, and has to be careful, and there are, as yet, distinct evidences of inactive disease at the summit of the left lung."

My own practice has given me several examples more positive in their results.

While in charge of the gynæcological service at St. Joseph's Hospital, Philadelphia, nearly four years ago, a young woman, unmarried, in the greatest suffering was brought to my notice. She implored operative interference for the relief of pain that had resisted medical treatment. To make a long story short, the case was one of salpingitis, and her suffering was so great that she was willing to risk any operation for its relief. She was phthisical, emaciated to a degree, had cough and night-sweats, and physical examination showed consolidation and softening at the right apex, with evidences of a small cavity already formed. The case was indeed a desperate one, but the necessity for immediate relief of pain was paramount. On the operating-table she fainted; by the aid of hypodermics of stimulants, etherization was finally accomplished, and I removed both tubes, much diseased, and also the ovaries. The wound healed rapidly, and a partial "rest cure" treatment was instituted. The patient, when I last saw her, was quite stout, happily married, and living still in Philadelphia.

In this case the relief from local disease and nervous strain, the establishment and maintenance of nutrition, arrested the lung trouble.

Another case, not so striking, perhaps, but equally important, came to me in the person of an unmarried seamstress—a young woman—with cough, emaciation, shortness of breath, and consolidation at an apex. She was an intelligent girl, faithful in carrying out her treatment—a most important consideration. Massage, electricity, Swedish movements, respiratory gymnastics, cold surface-sponging, milk diet, and sensible rest, accomplished the end wished for. My last letter from her told me that she was in excellent health, and at work, still living in Philadelphia.

The "rest cure," as instituted by Dr. Mitchell, is a combination of nutritive influences. It aids in establishing that resistance which enables a patient to benefit by more open air and vigorous exercise; it increases nutrition and establishes a foundation for bodily vigor. But you must associate all its elements—rest, not a mere continuance in bed in all cases, but rest in its true sense —a *dolce far niente* life; freedom from household cares or business worries; rest of mind as well as body; massage, electricity, nourishment pushed to its full extent, and the restoration of functions of secretion and elimination. Care also must be taken to remove physical drains, and the menstrual function should be made normal.

I have frequently heard many of you say that promising cases of early phthisis have had a fatal ending owing to the rashness with which they entered into the rough out-door life which this climate invites. Had these same cases laid a foundation of vigor by a systematic treatment calculated to improve their nutrition, how different would have been the result!

Possibly some of my hearers have overlooked the great necessity of such careful management, owing to the marvellous results they have seen from climate alone. If climate can so frequently accomplish wonders by itself, what cannot be expected from a "rest cure" treatment associated with it? Dryness of atmosphere, sunshine, bracing air, will add other elements to a combination which has proved itself useful in adverse surroundings. Indeed, I believe that eventually the treatment of such cases in sanitariums will continue to show such good results that this method will become most popular; but I earnestly suggest that at our noted health resorts the cottage system be adopted, in which patients can keep apart if they so desire, as I am sure there is nothing so demoralizing for an individual than to be obliged to associate with others in all stages of the same disease.

For the unfortunate many who are obliged to antagonize soil and climatic influences; who are obliged to withstand dampness, want of sunshine, and great changes, a "rest cure" treatment, it seems to me, shall have added to it the systematic inhalation of compressed oxygenated air, possibly medicated, and also a thorough course of pulmonary gymnastics. They should be impressed with the fact that the evil influences of their surroundings will again, as before, depress their vital forces, and that *the maintenance of their nutrition is as important as its acquisition.*

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## *DISCUSSION.*

At the conclusion of the reading of the paper, the President called on DR. B. F. D. ADAMS to open the discussion. Responding, the Doctor said: "I am sure we are all under obligations to Dr. Keating for a paper of such great practical importance. It is not a subject that we need theorize about, for every practitioner present has had experience in his treatment of his phthisical patients, of at least a modified form of the rest cure. As I have not been in active practice since living in Colorado, my opportunities of observation have been limited, and have mainly come through the courtesy of my professional brethren and through watching the history of my own case. But I have seen enough to have a few facts deeply impressed on my mind. One of these is the importance of rest in all cases of advancing phthisis, and another, the natural converse of this, that there is no one thing so injurious to the consumptive as over-fatigue. Where exposure to inclement weather is harmful to one, over-fatigue is injurious to a dozen. I have often said that I have had to unlearn much that I thought I knew about phthisis since living in this altitude. I am sure the natural history of the disease is, in some respects, different from that in the East. I strongly suspect that over-fatigue is more injurious than at the sea-level, and I am sure that the danger point is more quickly reached at this altitude. Unfortunately, people coming here are apt to measure their powers by what they could do before leaving home, and in attempting to take the same amount of exercise as had been their habit, they do themselves serious injury. Now I do not offer it as an excuse, but it occurs to me as an explanation of the advice so often given by our Eastern physicians that "they need not consult a local physician, but should at once purchase a horse and spend their waking hours in scouring the plains or climbing the mountains," that it is founded upon their Eastern experience, and that an amount of exercise which would be most disastrous in its effects here, might be taken perhaps with advantage at the lower level. A word about the rest cure as used by Dr. Weir Mitchell, and described by Dr. Keating. I do not know that I should follow him in advising it in its entirety. I should doubt the efficacy, in most cases at least, of electricity and massage. Massage, while theoretically giving us just what we want by improving the sluggish circulation and aiding nutrition in those who cannot exercise, has generally in my hands been disappointing. The ideal rest-cure, as I have seen it most successfully used here, is something like this. A breakfast in bed, then a leisurely rising with aid in dressing, with the rest of the day, or so much of it as is bright and sunny, passed in an easy-chair or hammock, where one can be protected from the wind or too much company; three good meals a day, and, if the digestion will take care of it, a little judicious feeding between-whiles. Of course, with some cases, where febrile movement is active, one must begin with a few days or weeks of absolute rest in bed, and in most weather with open windows. The rest cure, thus modified, we have all seen of the most incalculable benefit to the consumptive. I think it should be an axiom in the treatment of phthisis that, *where there is fever there should be quiet*, there should be rest. This is as true of the pyrexia of phthisis as it is true in any other disease. Unfortunately, we constantly see patients here impressed with the one idea of exercise in the open air, which they generally have gained from their home physicians, doing themselves irreparable injury by horseback or other violent exercise, when the clinical thermometer should send them to bed. It goes without saying that there are some patients of an active nervous temperament to whom confinement is too irksome to be borne, and to whom we are obliged to allow liberties which we should be glad to prohibit. With regard to exercise, it should be most gradual at first. After the passive exercise of driving comes what, I believe, to be the best of all exercises, walking, and, last of all, should come the favorite horseback riding, which I am sure is detrimental to a great many patients, and should be confined to those in good and fairly vigorous condition.

DR. TUCKER was the next to respond to the President's call. He remarked: I did not get here until Dr. Keating had nearly finished his remarks, so that I cannot discuss the paper as read, but feel sure that I can fully indorse all that may have been said as to the value of rest in the treatment of phthisis. I might say that my attention was directed to this subject about eighteen years since in a manner very mortifying to myself. A gentleman with incipient phthisis placed himself under my care and was advised the then orthodox treatment, sunshine, fresh air, exercise, etc. Failing to improve, after a short time he consulted an irregular practitioner, who at once put him to bed and kept him there, the sole medication, as I afterwards learned, consisting in the use of veratrum viride, to control the pulse. As the result of the change of plans, there was soon great improvement, and, so far as I know, the patient is alive to-day. This was the first time that my attention was called to the value of rest in the disease under consideration, but I have frequently since had opportunities of estimating its true worth, particularly in Colorado. When we consider that among the older writers increased frequency of pulse was often noted as preceding any other manifestation of the disease, that in these latter days of thermometry it is urged that fever first indicates its onset, it would appear that rest, absolute or partial, according to circumstances, was urgently demanded, and results strongly indorse the correctness of that opinion. When my attention was first called to the title of Dr. Keating's paper, "The Rest Cure in Incipient Phthisis," the question at once arose whether he would or not advocate the treatment adopted by Dr. Weir Mitchell, with all of its details. To prevent the ill effects incident to prolonged rest, in some parts of the country, all these are needed, I feel sure, but that some of the details may be dispensed with in Colorado is very certain. We find practically that a plan essentially as stated by Dr. Adams is all that is required. When exercise is ordered or permitted, it should be impressed upon the mind of the patient that any exercise, however slight, which is followed by rise of temperature, loss of appetite, or a condition of fatigue from which recovery is not rapid, is too great. It is a fact, which I have never heard commented on, by members of the profession, that both men and animals, when thoroughly acclimatized in Colorado, are capable of doing much more work than at sea-level, and that even when fatigue is great recovery is more rapid. Therefore, when recovery is delayed, whether there be fever or not, it indicates that too much has been done. In determining the amount of rest required in given cases, it has appeared to me that those having the nervous temperament require more than others, and that although the confinement may be particularly irksome at first the final results are better. As regards massage, particularly referred to by Dr. Adams, I have sometimes found it of great value. In a case under observation now for two weeks, exercise has been invariably followed by marked afternoon fever. Massage during the hours of pyrexia is followed by a reduction of temperature one to one and a half degrees. With rest temperature is normal and remains unaffected by massage.

DR. W. A. CAMPBELL addressed the meeting as follows: My experience in high altitudes has been very brief, and anything that I might say in reference to my experience here would have but very little weight either with the Society here or the people at large. I have had a little experience—considerable, I might say, for one of few years' practice in lower altitudes—and I have seen those that take the least amount of exercise and take nutritious food were those who lived the longest. My experience here for the past eighteen months has confirmed what I have seen in the lower altitudes. We are dealing with a disease that the first characteristics of, and the first symptoms that appear to the physician, are those of malnutrition, of hectic fever, of lowered vitality, or those in which the various organs of the system are debilitated. If we apply our knowledge in other branches of our science to this, we would say that to restore an organ, to build it up, to have it regain its usefulness, we would put that organ to rest as much as possible; and why not in the lungs as well as other organs of the body? So, looking at it from that standpoint, we would think that the rest cure was what was needed. I hardly think that it is practicable to carry out the rest cure of Dr. Mitchell in our patients here. They come here advised differently, which is a great detriment to them in many instances. Our atmosphere here is one-fourth less in volume than at the sea-level. We have to put forth twice as much exertion in breathing as at the lower levels to supply the demands of the body. There is a greater strain and stimulus upon the organs of respiration and circulation than there is at the sea-level. Taking this into consideration, it seems that rest to the body in general is what our patients need, and what the physician should advise them to take, rather than the violent exercises we see them participating in very often. I feel it a physician's duty in an incipient stage, and especially in those attended with pyrexia, to insist upon the patient being quiet, taking but little exercise, eating a nutritious diet, and being very cautious as to mountain-climbing, horseback-riding, and the violent exercise that has been spoken of here to-night. I feel it is incumbent upon this Society to send back to our Eastern physicians the admonition to caution their patients they send here in reference to taking the violent exercise that so many of them do take when they get here. I will say that, in my past experience of eighteen months, I have seen cases that rapidly improved where rest from active exertion was the rule. I will cite a case. I submitted to our bacteriologist a week ago some sputa of a man who presented all the evidences of recovering, and the physical signs were almost wanting; indeed, if I had not examined him a year ago, I would have told him that I had found no evidence of any trouble with the lungs. Upon examining the sputa Dr. Crouch found the dreaded bacilli present, and the man will have to remain in this altitude, or some place equally congenial.[1] Whether our cases are all of this class, or whether there are some absolutely cured, we will have to depend upon older members of our Society to tell us; but I am inclined to believe the cure will come in the course of time from the physical evidences that several cases have presented to me.

Dr. James A. Hart expressed himself as follows: I think that a great many patients, especially among women, depend in a measure upon recreation as well as rest. I believe that we should take advantage of every circumstance to encourage rest in the majority of cases. If we cannot get them to spend a day in bed, let them spend half a day in bed, or a few hours each day, especially in febrile cases. I have now a case of a young man who came to my office about two o'clock in the afternoon. I found he had a temperature of 102°. He had been in the habit of remaining up all day, riding horseback, and taking other exercise. I ordered him to go to bed after lunch, remain there until five o'clock, and take a reasonable amount of whiskey. The result was that in two weeks his temperature was down to normal and remained there. He kept up this afternoon treatment of rest and whiskey, and in the course of two months he gained about

[1] The treatment of this case consisted in the observance of rules for exercise rather than drugs.

eight pounds. I am strongly in favor of rest in phthisis—not forcing them to remain all day in bed, but encouraging them to spend a certain part of each day there, especially in the afternoon, if practicable, and occasionally allowing them to indulge in the theatre, or some amusement, with special permission. I consider whiskey to be one of our most valuable antipyretics, and where digestion is good usually prescribe it in connection with rest in the treatment of phthisis.

Dr. S. E. Solly. I agree with what has already been said concerning the importance of the study and care of the individual. The great variations in the individuality of the victims of phthisis make it impossible to apply the same rules of treatment to all.

The general condition of the patient, and the stage of the disease, must determine to what extent rest or exercise is called for. Dr. Campbell spoke of rest as being the important thing. In the early stage it is undoubtedly so in the majority of cases, but in many exercise is of greater value. Speaking broadly, it may be said that when the disease is becoming arrested, rest, which has been the most desirable, begins to give place in importance to exercise. Most patients are too active at first and later too lazy.

What Dr. Reed said about patients gaining in weight while their disease was extending, I have quite frequently observed.

As to the application of the rest cure, as carried out by Weir Mitchell, to the treatment of phthisis, I have never used it in its entirety, but I frequently use it in a modified form. When the disease is progressing rapidly, with emaciation and fever, and before a wall has been built up between the diseased tissue and the healthy, and particularly on arriving at this elevation, rest in bed with open windows, and with a cape and cap on if needed, is generally desirable; when the fever is subsiding, part of the day may be passed in undress in a reclining chair in the room, and then a little later the chair can be moved on to a balcony outside the bedroom window.

I regard such a balcony as of great value, as many patients are injured in their progress at first by having to use the general piazzas of the house, where they are expected to be dressed up, and are apt to be wearied by the society they meet on it. The partial isolation of such cases, in the beginning especially, is often of great value.

The details of the couches and chairs used are of much importance, the principle of the double incline plane as shown in a steamer chair being the correct one for day resting.

Sending patients with afternoon fever to bed for a few hours in the afternoon, as urged by Dr. Hart, is frequently of benefit; it breaks the day up into two, and so lessens fatigue. An occasional day in bed once a week is often an aid to weak and febrile cases.

Dr. Adams said he had not seen massage result in good. I, on the other hand, have, I believe, seen much good ensue from its judicious use. It is necessary, however, to choose the case, especially as regards individuality, for there are some to whom it is irritating or over-fatiguing, though this is often the fault of the masseur, who will work equally hard and long on all cases, or who has not a light hand and so hurts his patient. Also, when massage is being used, mistakes are often made in not regulating or interdicting exercise. I have often found a weak patient is best treated at first by massage with little or no exercise, then Swedish movements, next gymnastics, and finally full exercise.

Horseback exercise, as has been said, is frequently used to the damage of the patient. It is a common experience for a consumptive to arrive with a letter to a physician which he will carefully carry in his pocket while he hires a horse, dons a big sombrero, and proceeds to scour the plains. After a few weeks he calls on the doctor, saying, "Doctor, I think this altitude is too much for me." The mistake is in putting the horse before the doctor. I tell such as these, if they will first follow medical advice and exercise cautiously, they will soon cast off the doctor for the horse, and only need to wave their hand to him as they gallop by.

With respect to baths and subsequent friction, I have found them of great benefit, and believe we should always inquire into our patient's method of bathing, and modify it when necessary. Hot water, followed by cold douches, is often of service.

As regards sanitariums, my own experience is favorable to them for a large majority of the cases; though, for many, a home life is more successful.

As has already been suggested, while rest is often of value, there are many to whom restraints and routine are irksome, who need more or less excitement to enable them to bear the strain upon their minds caused by the knowledge of their disease, and consequent anxiety and distress. We have many patients cut off suddenly from their business or society, who need diversion to their thoughts, and so the number that can be safely put through a systematic rest cure are probably very few. But, however, we are certainly indebted to Dr. Keating for bringing the matter of rest forward for discussion, and he will have done us much good if he causes us to be somewhat more methodical and more careful of the details, in our use of resting, feeding, and bathing.

As far as we can generalize, it may be said rest with fresh air should be the chief point of treatment while disease is active and not as yet self-limited, and later, exercise. Never exercise during heightened temperature, and increase the exercise gradually.

Dr. W. M. Strickler observed: There seems to be but little disagreement of opinion with regard to this matter of rest in phthisis, and I can but add my experience to that of the gentlemen who have preceded me. I have seen a few cases that did well by travelling and running around, spending the summers in the mountains. At the same time, I am satisfied that a great deal of harm has been done by the advice of physicians to their patients to climb the mountains and take exercise of that sort—much greater harm than has ever been done by following the advice of those who are inclined to believe that rest is the better mode of treatment. With reference to my own views concerning the matter, I am rather cranky, and I dislike very much to get started, because I am very likely to say some cranky things—things that the majority of sensible men might look upon as delusions. But to look at this matter in a little different light, if this cure is better than others there must be reasons for it. Now I think there is a reason, probably more than one, that lies still deeper than any mentioned, and in order to remark upon the matter I will refer to it. What has struck me particularly is the inconsistency of some who advise a mode of treatment that is contrary to the theories they entertain. Now in nature's process of arresting the disease I think we have a point. I have made the assertion that the only way nature ever brings about an arrest of phthisis is by imprisoning the bacilli through the fibrosis process. Those men who believe in that process, nevertheless, advise —some of them—mountain climbing and active exercise; and others, while they advocate rest, advise lung gymnastics. Now, then, how is it that the disease spreads in the lungs? There may be more ways than one. At the same time, I believe it is generally admitted that the bacilli are carried from the affected part, in a large measure, through the respiratory currents. It would seem, therefore, that in order to prevent the spread of the disease, the greater quiet that is enforced upon the patients the less likely the disease is to spread by that means. On the other hand, the efforts which give rise to rapidity of respiration are more likely to carry the germs into the unaffected parts. Now one of my cranky notions comes in here, and that is with regard to the only point in which I differ from the paper. I believe not only in imposing rest—within reason, of course—upon the body at large, but upon the affected lung itself. I believe in that, because it is one of nature's ways of bringing about an arrest of the disease. You will find, as fibrosis goes on, and a contraction of the affected side occurs, a diminution of the movements of that side, and in some cases, where the cure is complete, the respiratory movements of the side will be found exceedingly impaired. I have had the good fortune to make "*post-mortem*" examinations upon several persons who are still living, and see how nature had effected an arrest of the disease. It is true that in those cases I found complications, but the disease had been arrested. Most of these cases are somewhat lengthy, and I will not narrate them; but I firmly believe that we ought to follow out the indications offered by nature. Now I have strapped the affected side in a few cases, and I expect to do it in others; I did it twice this afternoon. In one of my first cases the young man was under my observation for a number of years, and I found the disease spreading, and mercilessly so; I found also that nature was making an effort to bring about an arrest of it through fibrosis, and that a contraction of the chest wall was going on, and I thought I would assist nature and strap the affected side. I placed my straps in such a way as to increase that obliquity which nature gives the ribs in such cases, and thereby diminishes the antero-posterior diameter of the chest; and, in the course of a week or so, I saw that the scheme was having a good effect. I could see that the process of strapping was compressing the ribs and favoring nature. There was improvement. Expectoration was less. At that time it was supposed that the man would live only a few weeks. He really lived something over a year. Ultimately, the disease spread over the other lung and he was destroyed. Now, whether there be anything in it or not, I do not know, but it looks to me that, in imposing as much rest as possible upon the affected lung, we take a step in the right direction toward the prevention of the spread of the bacilli through the respiratory currents, and also in favoring the process of contraction of the lung, which seems to be nature's only process of imprisoning these germs.

DR. REED. You remember the case of that Peck boy? The original trouble with him was phthisis in the upper part of his right lung and subsequent empyema on the left. He had a fair amount of depression, with lots of râles on the right side, but that boy has since become well. Now, how do you account for the arrest of the disease in that case?

DR. STRICKLER. If that be true, as to the side affected, I certainly am mistaken. That does not alter the case, however. I can account for it, and for recovery in another case, in the same way. Now, in this case, I do not remember distinctly on which side the lung affection was, whether it was on the same side of the empyema or not, but we will say it was on the opposite side; and I also saw a case of Dr. Solly's in which there was an empyema on the side opposite the affected lung. In both of these cases the lung disease was arrested by an operation. The case of Dr. Solly's was, I think, really the better of the two to bring out the point raised by Dr. Reed. The empyema in this case was on the left side. The lung affection was principally in the lower portion of the right side. A tube was inserted through the chest wall in Dr. Reed's case, and worn for something over a year, and in Dr. Solly's for about eighteen months. Both were desperate cases, but the latter one was exceedingly so. The lung trouble in the latter case some months after the operation was still quite great. While wearing the tube, however, the case commenced improving, and I have not seen him recently, although some time ago I did, and he was in better health than he had been for years. Now the way I account for the arrest of the disease is this: I hold that one of the chief obstacles to the arrest of phthisis is found in the unyielding nature of the chest wall. Now you admit air to the left pleural cavity, the right lung being affected, in the place of the rigid chest wall on the left side of the right lung, so to speak, you have a yielding mediastinum that permits the process of condensation, granting that fibrosis has commenced, to go on much more perfectly than where such is not the case. I have seen a number of cases in which the admission of air to the pleural cavity has resulted in a complete arrest of the disease. I think, moreover, the plan of diminishing the chest cavity by operative interference, although seemingly a desperate measure, advisable in certain cases, for this reason: Where contraction goes on with such obstacles as the chest wall opposing, you have dilatation of the bronchial tubes, which are regular death-traps and are the causes of death in the vast majority of phthisical cases, in which nature made an effort at arrest of the disease, many of which go along two or three years after they were seemingly cured, and then die probably of infection of the opposite lung, on account of the poor drainage afforded the lung first affected by its dilated bronchial tubes.

Dr. Crouch said: I quite agree with Dr. Adams in reference to walking. It is by all means the best form of exercise for phthisical patients, better than riding which is too violent, or than driving where there are too many opportunities for taking cold, at least in the winter. Only patients must not walk too far. For this reason there should be constant opportunities to sit down, benches placed in sheltered places, so that patients can rest the moment they feel the slightest fatigue. Otherwise they are liable to over-exert themselves, and over-exertion I regard as the greatest danger. Dr. Solly mentioned some points which have always seemed to me of importance. They are matters of detail, but details are of the utmost importance. The most we can accomplish in the treatment of phthisis is by attention to details. A comfortable chair or couch on which patients, even those with little trouble, can rest in the open air, when not taking exercise, is of the greatest importance. My steamer chair, with a long cushion, has been my constant companion for some years, and has been of immense value to me. Patients coming here from the East should be directed to bring one with them, as they are not to be had here in the Springs at present. Patients are too often sent here with directions as to what to do, and told that they need no doctor. A greater mistake could not well be made. One great advantage of sanitaria is the constant medical supervision, whereby patients are prevented from harming themselves by their ignorance. I am convinced that patients see too little of their doctors here. Further, a balcony protected from the wind, and exposed to the sun, where patients can sit in almost any weather, is a great desideratum, and deserving of attention in selecting houses here. I was greatly impressed by the open halls and comfortable reclining chairs in Detweiler's Institute in Falkenstein. Patients are encouraged to sit out, properly protected and with proper coverings, in all kinds of weather, and much of the good results are undoubtedly to be attributed to this. Then in regard to massage. I think a modified form of massage is very frequently of great benefit, or you might call it possibly a modified form of bath. It is what the Germans call a *kalte Abreibung*, where the patient is rubbed with a dry cloth, then with a sponge of cold water and then rubbed off again with a dry cloth, before the patient gets up in the morning.

Dr. Keating, referring to one point, and that is the use of oxygenated air, I suppose oxygen and diluted with air. It seems to me that the trouble is not with lack of oxygen, bnt with the oxygen carrier, the red blood corpuscles. I cannot see how inhalations of oxygen can be of use, on the contrary, they seem to me to be contraindicated, even supposing that more oxygen can thus be introduced. The destructive process in phthisis is too great as it is, and if oxygen is to accomplish anything it is to accomplish the breaking down of the tissue more rapidly than is taking place at present. I do not see exactly that the breathing of oxygen has in the ordinary treatment of phthisis any real place.

DR. HAZLEHURST. One point struck me this evening, and that is with reference to walking. So many people come out here and proceed to such violent exercises, whereas more attention paid to walking exercise would get better results; but the walking should be on the level and not mountain climbing, and should be increased gradually.

DR. J. M. KEATING, being called upon by the President to close the discussion, did so as follows: I am very glad indeed to hear the opinions entertained and expressed in regard to the various points that I endeavored to bring out, and the various suggestions that I have endeavored to make in this short paper. The matter was of very great interest to me, not exactly as in the line of work I have marked out for myself, but from the fact of my coming here, and having leisure to watch other physicians and patients here. I could not help noticing that nearly all patients coming here have received the advice "to buy a horse and ride it." Camping out seems to impress every one of them. They have been advised not to consult a doctor; not to be advised by physicians of the place, who have had large experience, and who probably know their disease a great deal better than many doctors who see little of it in the East. They are advised to take active measures in the start. The object of this paper was to determine whether it was or not the sentiment of the meeting that people coming here with phthisis should take active exercise at once. By the rest cure we do not mean to grant the importance of any specific action to massage, electricity, etc., but we simply mean rest for the individual's body and mind, and the promotion of nutrition by *systematic* treatment. It is not a treatment of cast-iron that everybody should go through; it should be modified to suit each case. Dr. Reed said that some people get an increase of weight but no strength. I saw a case this morning with Dr. Solly who had gained fifteen pounds, and yet whose disease was progressing; but weight itself is not an indication of an increased nutrition. It may be due to fat and an evidence of mal-nutrition. Now, increased nutrition may be brought about by systematic and sensible feeding, not by stuffing, and to this must be added rest, fresh air and sunshine, etc., stimulating mind as well as body. Those patients who come here should not be instructed to take active exercise at once, but to get it gradually. That is sufficient. Now, as regards the treatment suggested by Dr. Strickler, it is very interesting, and always struck me as being a very important point. It seems to me a very curious thing that if we have a tubercular disease of the hip-joint, that joint has to be put to rest, absolutely, at once, with the least possible motion. The object, of course, is to incase the bacilli, to keep them from getting further, and the most eminent authorities tell us that if this is done in the early stage the bacillus dies and the patient will get well; but it requires absolute rest. But if the surgeon finds it necessary to give rest to a tuberculous joint, why does the physician order pulmonary gymnastics or altitude for the tuberculous lung? The two facts remain—that we give rest to the joint, and we give exercise to the tubercular lung by breathing the air at high altitudes. The explanation of this seeming paradox is, in my opinion, that by altitude we bring into action portions of the lungs that have never been used before by the individual, and we thus relieve the pressure from the portion that is diseased. The circulation is more universally spread throughout the whole body; there is less blood pressure, and this, in all probability, means in reality *rest.*

# THE FRENCH RIVIERA—HYÈRES AS A HEALTH RESORT.

By CH. E. CORMACK, M.D.,
HYÈRES, FRANCE.

Of all the winter stations along the French Riviera, Hyères, situated in the department of the Var, is the most southern, as a glance at the map will at once show. It is also the warmest and at the same time the one possessing the most equable temperature, and it has also the advantage of being the nearest to England.

Hyères proper, or the old town, lies on the southeast side of a hill, the Castle Hill, and is composed of a number of narrow steep streets. The houses, as a rule, entirely lacking in architectural beauty, are badly lit, indifferently ventilated, and devoid of most modern comforts. They are principally inhabited by the poorer classes. Very different is the new town or new quarter, with its stately mansions, handsome villas, splendid hotels, and public buildings, its magnificent avenues, wide streets, and public gardens. Naturally, it is in this part of the town that the invalids and visitors live.

On the top of the hill is the Chateau of Hyères; the castle is 657 feet above the sea, and is supposed to have been built in the ninth century. Much of the ruins still remain, such as parts of the walls, towers, dungeons, etc.

The town is distant from the sea three miles, while one of its suburbs, Costebelle, composed of one or two detached houses and three large hotels surrounded by pine woods, is almost on the coast, thus giving Hyères the advantage of a bracing and stimulating atmosphere for those cases requiring it, or, where the sea-air is too invigorating the relatively more sedative air of the town. Many patients are sent from the one to the other during the season for a little change with marked benefit, and as Hyères town and Costebelle are both largely used by invalids, and as the temperature and rainfall are approximately the same for each, all remarks on these points must be considered to apply to both of them.

The town is surrounded by a circle of picturesque mountains and green hills by which it obtains much protection from the winds. Mount Fenouillet, 981 feet high, and Mount Coudon, 2305 feet high, act as efficient barriers to the north wind; while the Maure Range, of which the highest peak is 2556 feet above the sea-level, acts as a screen against the cold Alp air.

It has been remarked that during the spring months certain winds are more prevalent than others, and that there is a certain regularity in the order with which they follow each other. Their direction and order are very much in this wise: east, northeast, south, and southeast. The winds most common in the summer are those from the south, southeast, and southwest. During the autumn months the east, north, and west winds are those most frequently met with, and they all blow in about the same proportion. During the winter the winds are much more violent, and sometimes there are some very violent storms which have a marked influence upon the temperature and may cause a sudden fall of from 6° to 10° F. The reigning winter winds are north, northeast, and northwest. This latter wind is popularly known in the country by the name of "the mistral." It is a most searching wind and very trying to invalids and those of a nervous temperament. Patients, as a general rule, are much better at home than out of doors while it lasts. By some people this wind is looked upon as a blessing in disguise, and it is said that, thanks to it, Hyères is always free from epidemics. The mistral is not peculiar to Hyères, however; it is to be met with all along the Riviera, and in very much the same proportion.

While these are the winds most frequently to be met with in the given months, they are often so mild as not to exceed a gentle breeze, and it frequently happens that in the course of a single day their direction changes many times. In every month there is an average of 15 days, at least, upon which the wind is *nil*. For this station, when considered as a health resort, the only months which are of any interest, from a medical point of view, are those comprised between October and May, and it is to these months alone that all further remarks apply. During these eight months one may count upon having a minimum of at least 116 days which are perfectly calm out of the 243 days, and during the windy days a maximum of about 20 days of mistral. This relatively high number of calm days is a most important point to note, as it is during these eight months that the invalids flock to this station.

The winter at Hyères is exceptionally mild. One has but to see the mountains and hills covered with trees as green in the winter as in the summer, and to note the variety of plants, many of them of tropical origin, to be at once convinced of the veracity of this statement. Another proof, were it wanting, is the *specialité* of Hyères in the rearing of early vegetables for the northern markets, such as artichokes, green peas, strawberries, potatoes, etc., and of fruits, peaches, apricots, etc., and the enormous trade that is done in the exportation of flowers, roses, violets, anemones, minosa, hyacinths, etc., being sent in vast quantities during the whole of the winter to all of the European flower markets. There is no lack of orange trees; the olive is largely cultivated, and the production of olive oil is one of the trades of the country. Palm trees are to be seen on every hand, and border many of the avenues. The woods are formed in large part by the Aleppo, Pinus Alepansis, and the Maritime and Italian pines are to be met with everywhere. The Pinus pinca, or umbrella pine, forming enormous parasols, are to be found in large numbers near the coast; the Quercus suber, or cork oak, is very common on the mountains, and is cultivated for the manufacture of corks, also one of the trades of the town. The Quercus coccifera, the evergreen oak, Quercus flex, Quercus ubur, and Myrtus communis, are common all over the hills, as also the pretty strawberry tree, Arbutus unedo, so called by the strong resemblance of its fruit to strawberries. Numerous varieties of ferns abound, the Asplenuim capillus veneris and Ophioglossum lusitcenticum amongst others. All over the place are to be seen the Cistus albidus, the Citrus Monpeliensis and Salvifolius, the Juniperus Oxycedrus, Laurus nobilis, Nerium oleander, the wild olive, Olea Europea, the pomegranate, Punica granaticum, many species of heather, and more particularly the Erica arborea, of which the roots are employed in the manufacture of briar pipes. The Smilax aspera, Chymus serjullum, Lavandula, Stæchus, Rosemary (Rosmarinus officinalis), Asphodelus microcarpus, etc.

In a general way the temperature during the winter months may be said to vary between 50° and 59° F., between the hours of 8 A. M. and 4 P. M., taken in the shade; and from 75° to 85° F. in the sun. Both the early morning and evening temperatures are often very low, and there is always a rapid fall in the thermometer after sunset, frequently as much as 7° or 9° F. Occasionally the mercury even falls below freezing-point; but when the sun rises, the mercury goes up very rapidly.

No more at Hyères than at any other place do two consecutive winters resemble one another either as to temperature or moisture. The only way, therefore, to obtain a fair average on these points is to compare the results of a number of years. I have come across many valuable tables on these subjects when consulting the work of Monsieur O. Denis,[1] some of which I have utilized for the purpose of this paper. They extend over a series of years, and have the advantage of not having been specially chosen to give unduly favorable results. The temperature charts in the original are in centigrade, but I have reduced them to the Fahrenheit scale. In the same way, when treating on the rainfall, I have reduced the metrie scale to inches.

In the work I have just quoted there appears a table giving the average monthly temperatures for a period extending over forty years, viz., for the years 1810 to 1850, drawn up by M. Hippolyte David de Beauregard, a man noted for the scrupulous accuracy of his meteorological observations. Though the table is much too long to be reproduced here, there is much useful information to be gleaned from it. During these forty years it was noted that the minimum temperatures occurred twenty times in the month of January, nine times in December, eight times in February, and three times in March, and that during all these years the minimum temperature was only six times below 26° F. In three of these forty years the mercury never fell as low as freezing-point. The average minimum temperature for the

[1] Hyères Ancien et Moderne by Monsieur O. Denis, revised and corrected by Dr. A. Chassinat.

whole period was 29° F. Naturally, these minimum temperatures represent the night readings of the thermometer. A table representing the average minimum temperatures for twelve of these years, viz., 1830 to 1840, for Nice, shows it to have been 27½° F., or 1½° below that of Hyères.

By another table extending over five years, viz., 1874 to 1878, giving the readings at 8 A. M., and at midday, in the shade, the minimum at 8 A. M. is shown to be 36° F., and at midday 41° F., while the average midday temperature for the same period for the months of October to May is 60° F., and, if the three months, December, January, and February, alone are considered, the average is still as high as 54° F.

The following table is obtained by comparing the averages of 17 years, not consecutive years, but short periods of 4–5 years, etc., added together:—

I.—*Average temperature in the shade* (*northern exposure*).

| | Months. | Mid-day. | | | Eight o'clock in the morning. | | |
|---|---|---|---|---|---|---|---|
| | | Maximum. | Minimum. | Average. | Maximum. | Minimum. | Average. |
| Monthly averages for 17 years. | January | 61 | 45 | 53 | 54 | 37½ | 45¾ |
| | February | 60½ | 45½ | 53 | 54½ | 37½ | 46 |
| | March | 63 | 49 | 56 | 57 | 39½ | 48¼ |
| | April | 72½ | 55½ | 64 | 61 | 49 | 55 |
| | May | 79 | 62 | 70½ | 70½ | 54½ | 62½ |
| | October | 74 | 62½ | 68¼ | 68½ | 48¼ | 58½ |
| | November | 68 | 50½ | 59¼ | 59½ | 39½ | 49½ |
| | December | 59½ | 43½ | 51½ | 55½ | 37½ | 46½ |
| Total averages. | Eight months | 67 | 52 | 59½ | 60 | 43 | 51½ |
| | Six months (Nov. to April) | 63 | 48 | 55½ | 57½ | 39½ | 48½ |
| | Three months (Dec. to Feb.) | 59¼ | 45¼ | 52¼ | 54½ | 37½ | 46 |

Needless to say that this table represents only normal years, or, in other words, short periods taken at hazard, and it is only thus that it is possible to obtain a really true average.

A glance at the above table shows that the average midday temperature taken in the shade is 59½° F. If the average of the whole eight months, from October to May, be taken, for the six months, November to April, it is naturally somewhat less, only 55½° F., while for the three months, December to February, the average descends to 52½° F.

At 8 A. M. the averages are 51½° for the eight months, 48½° F. for the six months, and 46° F. for the three months.

If, instead of considering the morning and midday average temperatures, we consider the average daily temperature, it will be found to be as follows:—

| | |
|---|---|
| For the 8 months, October to May . . . . | 51° F. |
| For the 6 months, November to April . . . | 49½ |
| For the 3 months, December to February . . | 46 |

On consulting more recent tables the results are approximately the same, and confirm the above figures. I shall, therefore, confine myself to these tables, as they represent the fair averages, and sufficiently prove the mildness of the winters at Hyères.

While it is very rare for the snow to fall here, the average is said to be about once in three years. It does fall occasionally, but it rarely remains more than an hour or two at maximum on the ground. Now and again during the night-time there is a light frost, but as no invalids are out of doors at that time, it is altogether of secondary importance.

The pressure of the air varies from 29.69 inches to 30.40 inches, or, in other words, the fluctuations of the barometer are about ¾ inches.

The following table drawn up by Dr. Honoraty, gives the mean monthly readings of the barometer for nine years. By it, it will be seen that the average readings for the eight months, October to May, is 30.12 inches; for the six months, November to April 30.16 inches, and for the three months, December to February, 30.20 inches.

II.—*Average monthly readings of the barometer for nine years.*

| Months. | Maximum. | Minimum. | Average. |
|---|---|---|---|
| | Inches. | Inches. | Inches. |
| January . . . . . . . | 30.51 | 29.77 | 30.24 |
| February . . . . . . . | 30.51 | 29.83 | 30.20 |
| March . . . . . . . . | 30.32 | 29.63 | 30.20 |
| April . . . . . . . . | 30.28 | 29.65 | 30.4 |
| May . . . . . . . . | 30.28 | 29.73 | 30.4 |
| October . . . . . . . | 30.36 | 29.77 | 30.8 |
| November . . . . . . . | 30.32 | 29.69 | 30.8 |
| December . . . . . . . | 30.47 | 29.53 | 30.16 |
| Total averages for 8 months . . . . | 30.40 | 29.69 | 30.12 |
| Total averages for 6 months (Nov. to Apr.) | 30.43 | 29.65 | 30.16 |
| Total averages for 3 months (Dec. to Feb.) | 30.47 | 29.65 | 30.20 |

The variations in the air-pressure are much more considerable at Nice, Cannes, and Mentone. Dr. Collier states it to be between 28.82 inches and 30.32 inches at Nice, the mean reading being 29.60 inches as against 30.16 at Hyères. According to Valcourt and Petit, at Cannes the mean average is 29.88 inches, while for Mentone, Bréa, and Farina they place it at 29.77.

By comparing these figures

| | |
|---|---|
| Hyères . . . . . . | 30.16 in. |
| Cannes . . . . . . | 29.88 in. |
| Nice . . . . . . . | 29.60 in. |
| Mentone . . . . . . | 29.77 in. |

the marked advantage possessed by Hyères over her sister stations in respect to the air-pressure is obvious.

The air at Hyères is moderately dry, and the town can be said to be entirely free of mists, although during the rainy weather the crests of the hills are often enveloped in vapor. Cloudy days are the exception, while a blue sky is the rule.

The differences in the rainfall from one year to another vary to such an extent that it is a somewhat difficult matter to obtain any real annual average; what is of vastly more importance, however, is to discover the number of fine days that the patients may reasonably expect to have during the eight months in which this station is used a winter health resort.

By consulting the following table, covering a period of twenty-one years, viz., 1809 to 1829, you will see the actual number of days upon which rain fell, even though it were only a few drops.

III.—*Number of days on which rain fell, whether much or little.*

| Years. | Months. | | | | | | | | Yearly totals. |
|---|---|---|---|---|---|---|---|---|---|
| | Jan. | Feb. | Mar. | April. | May. | Oct. | Nov. | Dec. | |
| 1809 . . . | 6 | 5 | 4 | 6 | 3 | 1 | 6 | 4 | 31 |
| 1810 . . . | 2 | 1 | 1 | 5 | 7 | 8 | 7 | 2 | 33 |
| 1811 . . . | 5 | 12 | — | 2 | 4 | 4 | — | 2 | 29 |
| 1812 . . . | 3 | 4 | 3 | 3 | — | 11 | — | 3 | 27 |
| 1813 . . . | 5 | — | — | 1 | — | 3 | 7 | 6 | 22 |
| 1814 . . . | 11 | 1 | 3 | 1 | — | 2 | 2 | 7 | 27 |
| 1815 . . . | 5 | 4 | 1 | 5 | 4 | 5 | 6 | 2 | 32 |
| 1816 . . . | 6 | 7 | 3 | 13 | 4 | 7 | 9 | 4 | 53 |
| 1817 . . . | 5 | — | — | — | 4 | 4 | 3 | 6 | 22 |
| 1818 . . . | 5 | 2 | 2 | 7 | 5 | 1 | 6 | 15 | 43 |
| 1819 . . . | 2 | 4 | 4 | 5 | 4 | 7 | 11 | 7 | 44 |
| 1820 . . . | 6 | 6 | 4 | 2 | — | 13 | 13 | 4 | 48 |
| 1821 . . . | 6 | 1 | 8 | 7 | 3 | 5 | 9 | 6 | 45 |
| 1822 . . . | 2 | 1 | — | 7 | 6 | 4 | 5 | 5 | 30 |
| 1823 . . . | 8 | 3 | — | 3 | 2 | 5 | 2 | 7 | 30 |
| 1824 . . . | 2 | 6 | 1 | 5 | 2 | 8 | 2 | 3 | 29 |
| 1825 . . . | 2 | — | 3 | — | 4 | 3 | 4 | 4 | 20 |
| 1826 . . . | 5 | 6 | 7 | — | 4 | 9 | 9 | 6 | 46 |
| 1827 . . . | 5 | 9 | 1 | 3 | 4 | 11 | 2 | 5 | 40 |
| 1828 . . . | 4 | 2 | 1 | 3 | 3 | 6 | 7 | 2 | 28 |
| 1829 . . . | 8 | 3 | 5 | 3 | 9 | 3 | 4 | 6 | 41 |
| Totals . . . | 103 | 77 | 51 | 81 | 72 | 120 | 114 | 106 | 724 |
| Monthly average for 21 years . . | 5 | 4 | 2 | 4 | 3 | 6 | 5 | 5 | 34 |
| Average for 6 months (Nov. to April) . | — | — | — | — | — | — | — | — | 25 |
| Average for 3 months (Dec. to Feb.) . | — | — | — | — | — | — | — | — | 14 |

To table III. I add table IV. for comparison.

IV.—*Number of days on which rain fell (much or little), for the years* 1874 *to* 1878.

| Months. | 1874. | 1875. | 1876. | 1877. | 1878. | Monthly average. |
|---|---|---|---|---|---|---|
| January . . . . | 3 | 2 | 9 | 3 | 2 | 4 |
| February . . . . | 8 | 2 | 3 | 4 | 1 | 4 |
| March . . . . . | 5 | 2 | 6 | 3 | 4 | 4 |
| April . . . . . | 5 | 5 | 8 | 6 | 3 | 5 |
| May . . . . . | 7 | 3 | 7 | 9 | 4 | 6 |
| October . . . . . | 11 | 6 | 4 | 5 | 1 | 5 |
| November . . . . | 6 | 5 | 6 | 10 | — | 5 |
| December . . . . | 6 | 7 | 7 | 4 | 4 | 6 |
| Totals . . . . | 51 | 32 | 50 | 44 | 19 | |

Average for 8 months, October to May . . . . . . 39
Average for 6 months, November to April . . . . . . 28
Average for 3 months, December to February . . . . . 14

By table III. it is shown that on an average there are 34 wet days during the months of October to May; if only the six months, November to April, are considered, the annual average is 25 days, and for the three months, December to February, 14 days. For no one of these twenty-one years were there less than twenty days in which the rain fell, and only on one occasion were there as many as fifty-three days.

Table IV., giving the total number of rainy days for the five years 1874 to 1878, gives us substantially the same mean readings.

Table III., for 8 months, 34; six months, 25; three months, 14.

Table IV., for 8 months, 39; six months, 28; three months, 14.

By uniting the results of these two tables we obtain Table V., giving the monthly averages for twenty-six years, averages which are as nearly as correct as it is possible for them to be.

V.—*Monthly averages of wet days, obtained by the averages of 26 years* (1809 *to* 1829, *and* 1874 *to* 1878).

| Months. | | | | | | | | Total averages. | | |
|---|---|---|---|---|---|---|---|---|---|---|
| January. | February. | March. | April. | May. | October. | November. | December. | Eight months. | Six months. | Three months. |
| 4 | 4 | 3 | 4 | 4 | 6 | 5 | 6 | 36 | 26 | 14 |

Thus, out of 243 days representing the eight months, there are but 36 wet days, and invalids can count upon an average of 207 fine days, a very high percentage for a winter anywhere.

These figures compare very favorably with Nice, Cannes, and Mentone, where the mean readings are given respectively as at 51, 54, and 64. From the foregoing tables it will be remarked that the average number of wet days per month is between four and five, but more usually only four, that October and December are the wettest months, and March, the finest.

If it is possible to obtain some approximately correct results as to the number of wet days, it is quite another matter when it is a question of the average rainfall—no *average* rainfall can be a *true* average.[1] Averages here mean nothing, for in some years, where the number of wet days have been exceptionally numerous, the rain-gauge has been remarkably low, while in other years when the number of fine days have been much above the average, the rain-gauge has also been much above the average. This result is brought about by some of the very heavy downpours of rain that occur every now and again, and with more or less frequency, making calculations out of the question. Under these circumstances I think it needless to give any tables on this subject; I will simply say that from a paper I have before me giving the amount of rain for a period extending over twenty-four years, the largest quantity measured in any one year was 52 inches, and the smallest quantity 15 inches. This would give an average of 33½ inches, but where the difference from one year to another is so great an average becomes practically useless.

Having touched upon some of the most important points concerning the climate of Hyères, I shall now say a few words upon the class of patients to whom this climate is specially indicated.

Hyères is admirably suited to cases of phthisis. Should the disease be in its first period when the patient arrives, a complete cure may take place. The same result may be obtained with cases which have arrived at their second period, although the chances are less, but in any case a considerable improvement may be expected. When the disease has passed into the third period, or is too far advanced for any reasonable hopes of recovery, to be entertained, life is prolonged for a time.

All chest-complaints and bronchial affections improve under this genial climate. Liver-complaints, affections of the kidneys, Bright's disease, diabetes, etc., are all favorably influenced by the warm and equal temperature.

Gouty and rheumatic cases get on very well here, and generally are much relieved after a winter or two's residence. This is only what would naturally be expected when one bears in mind of what capital importance a dry and warm climate is to such cases, and

[1] Especially attention should be called to the statement, an *average* record, whether of barometer, thermometer, or hygrometer. Is absolutely useless, it is even absurd, in estimating the *therapeutic* value of a climatic resort.—Ed.

the great benefit they derive from out-door exercise, for which Hyères offers special facilities, for there is hardly a day upon which an invalid is unable to get out for at least an hour or two unless the nature of his complaint keeps him confined to his bed.

Cases of anæmia and asthma also do remarkably well for the same reasons.

The invalid's day is comprised between the hours of 10 A.M. and 4 P.M. for the warmest months, and 11 A.M. to 3 P.M. when the days are colder. Naturally, special cases have to follow special rules; but no invalids, in any case, should go out until the sun is well risen, nor after sunset, as both before and after sunset the temperature is many degrees below what it marks in the middle of the day; it is specially dangerous for delicate persons and those having weak chests to go out after sunset, for there is invariably a very rapid fall in the thermometer at this time. A most useful precaution for all patients is to be provided with a shawl when passing from the sun into the shade, as the difference of the two temperatures is very considerable. There are certain times, during the mistral, for instance, when invalids do well to keep within doors; more particularly is this the case for those of weak constitution or nervous temperament.

Nowhere along the Riviera are the sanitary arrangements perfect, and at Hyères, as at all the other winter stations along the coast, there still remains much to be done. Every year, however, more attention is paid to these matters, and at the present moment Hyères is in a much better sanitary condition than most of its neighbors. There are many first-class and good hotels in the town, where every attention is paid to the comfort of the strangers frequenting this station, both in respect to hygiene and food. They are too numerous to be mentioned by name. In one or two of the more recently constructed hotels everything in this respect is perfect. The same may be said for the majority of the boarding-houses and furnished apartments, although it is always better for the visitor to put up, in the first place, at the hotel, and to inspect personally, when possible, any apartment before becoming a tenant.

At Costebelle there are but three hotels, situated in the midst of the pine woods; they are all under English management, and first-class houses. Two of them, the Hotel Peyron and the Costebelle Hotel, belong to the same proprietors, and as far as comfort and sanitary arrangements are concerned leave nothing to be desired. The other hotel, the Hotel d'Albion, is owned by an English company, and has been very much enlarged recently. Nothing more perfect, as regards sanitary arrangements, could be found anywhere; each hotel possesses its own telegraphic bureau, and all of them are largely frequented by the English and the Americans. Queen Victoria has definitely arranged to spend some time at Hyères, and has secured the Hotel Peyron and Hotel Costebelle for herself and her suite.

Visitors to Hyères will find plenty of delightful drives and promenades, and much interesting occupation can be found for those whose health will admit of their getting out. The lovers of botany will find at Hyères and its environs a wide field for their labors; the butterfly-collector will be surprised at the number of beautiful and rare butterflies to be found in the woods; the antiquary will visit with pleasure Pomponiana, a short distance from Costebelle, the site of an ancient Roman town, many old Roman medals, pottery, and some vases having been discovered here. For those who have a taste for boating, or who are fond of sea-fishing, they will find their wants easily supplied. Those who prefer golf or lawn-tennis will find an excellent golf club recently inaugurated, and lawn-tennis courts everywhere.

# REVIEWS.

A System of Practical Therapeutics: Edited by Hobart Armory Hare, M.D., Professor of Materia Medica and Therapeutics, Jefferson Medical College, Philadelphia; assisted by Walter Chrystie, M.D. In 3 vols. Vol. I. Lea Bros. & Co., Philadelphia. 1891.

At the present time, when disease is being well treated in a scientific manner, and where the therapeutic considerations governing all treatment have reached so high a state of development, a system of therapeutics, edited by Dr. Hare, cannot fail to aid the practitioner. The system aims to present to the reader the results of therapeutic progress as they have been attained and observed by eminent practical men in all parts of the world.

As a fitting introductory, Dr. H. C. Wood, himself the greatest living therapeutist of this age, contributes a number of "General Therapeutic Considerations." In his article Dr. Wood discusses under methods, therapeutic symptomatic laws, Homœopathy, and empiricism, designated "a survivor of mediæval dreams," and the scientific method of treatment. In the latter we have "indications" or "the pointing of nature for relief."

To properly study a case for therapeutic purposes the physician is told to consider the cause, the course, and the method of death. Next dosage calls for attention, and then the physical state of the patient, age and sex, time and method of administration of remedies, emotional tendencies, temperament, and idiosyncrasy must all be observed. Finally, where there is more than one indication to be met, the manner of combining several drugs to act either as one drug the resultant of such combination, or as uncombined drugs is carefully set forth.

Professor Remington in the following article deals with "Prescription Writing and the Combination of Drugs." Rules are laid down for the proper and clear writing of all prescriptions. A concise arrangement of weights and measures of various sorts, and an extensive glossary of terms is valuable. The various pharmaceutical preparations are described, and a table of incompatibilities with examples of faulty prescriptions follows.

Under the heading of Remedial Measures, other than drugs, the following therapeutic means are discussed:—

"Electro-therapeutics," by Dr. Rockwell; "The Rest-cure for Neurasthenia and Hysteria," by Dr. Jno. K. Mitchell; "Swedish Movements and Massage," by Dr. Benj. Lee; "General Exercise," by Dr. Edw. Hartwell; "Climate," by S. Edwin Solly, M.R.C.S.; and "Hydrotherapy and Mineral Springs," by Dr. Simon Baruch.

Preventive medicine deals with "General Sanitation," by Dr. Henry R. Baker; "Disinfection," by Dr. G. M. Sternberg; "Antisepsis and Asepsis," by Dr. J. Wm. White; and "Nutrition and Foods, including the treatment of Leanness and Obesity," by Dr. I. Burney Yeo.

Then follows the treatment of the various classes of diseases, commencing with "Diathetic Diseases and Diseases of Nutrition."

The treatment of "Tuberculosis" is from the pen of Dr. S. Solis-Cohen, and we are told at the outset that it is "a curable disease, though later we shall have to qualify" that statement. Prophylaxis in the child, adult, and old, in diet, dress, mode of life, and place of living is set forth with the greatest care. All means of employing respiration, both of atmospheric, compressed, or rarefied air, whether medicated or not, is carefully considered. Dr. Cohen then concludes his article with an exhaustive review of the remedial agents for the pyrexia, lesions, complications, and sequelæ of this dread disease.

"Scrofulosis and Rachitis" are next considered by Dr. Chrystie, who places before us the best means of preventive and remedial treatment.

"Acute and Chronic Articular Rheumatism," by Dr. Jas. Stewart, and "Scurvy," by Dr. Jno. B. Hamilton, embody the results of the latest therapeutic research.

In discussing the treatment of "Diabetes Mellitus," Dr. F. A. Packard recognizes that prophylaxis is of but small avail, and he considers that dietetic treatment, or the plan regulating the diet, is the better course to follow. A very full table of articles that contain much starch and analysis of the various ingredients, together with proper diet tables and the effect of exercise and climate upon the disease, are very efficient aids in this troublesome disorder. Medicinal treatment is considered to be of the least use, and should not be heavily drawn upon save as a last resort where restricted diet, exercise, and careful hygiene fail. The author places the greater dependence upon the former, and uses the latter, at least to any extent, only as a matter of necessity.

# CORRESPONDENCE.

CAIRO, EGYPT.

*Dear Sirs:* As you see, I received your letter, and now I have also got the October CLIMATOLOGIST. I thank you for the honor you confer on me in desiring to add my name to the list of eminent Associate Editors you have already obtained. I have looked over the copy and notice that you have a very full report of the International Hygienic Congress. There were two important papers read at it which your reporter has not noted—one on Egyptian Demography, by Greene Pasha, Director of the Egyptian Sanitary Department; and the other on Cholera, by Mr. Sandwith, one of the physicians attached to the native hospital at Cairo. The latter was supposed to favor the theory that cholera is epidemic in Egypt according to the political view of the British Government. It was natural to suppose so, because all the official medical men who were known to oppose this theory were either dismissed from office or a stop put to their further progress in the service, while Mr. Sandwith was in high favor and put into high official positions.

Now, after having studied the matter on the spot these eight years, he has come out as a thorough disbeliever in the endemic theory and has published his opinion, and still holds his post. He has had the hardihood to do this (to publish his opinion) because he found that the British Government policy had veered round—not that they ever believed that cholera was endemic in Egypt, but it simply suited their policy to aver so at the time, and they found a member of our profession ready and willing to prostitute himself to their purpose.

That quarantine very much enslaves commerce there can be no doubt, and England is a commercial nation, therefore is very much opposed to it, but she unknowingly stultified herself in 1883 by representing to the world that it was impossible that the cholera could have been imported into Egypt from India because when it broke out at Damietta the steamers from Bombay were passing through the Suez Canal in quarantine. Here, then, we have the British Government itself arguing for the efficacy of quarantine, while we know that under other circumstances she declares quarantine to be annoying and useless.

"There are none so blind as those who won't see," for while the Bombay infected steamers were passing through the Suez Canal in quarantine they dropped their Arab firemen, whose names were not on the log, at a convenient place some five or six miles south of Port Said where there was no medical inspection at all. These firemen took boat and sailed over to Damietta, where their families reside, and in this way Damietta was in direct free communication with Bombay at a time when cholera was raging epidemically in Bombay. This statement of facts is surely sufficient to solve the mystery of the origin of the cholera in Egypt in 1883. Mr. Sandwith leaves it a mystery as to how it was imported, and seeks to draw our attention from India to the Hedjaz, but the cholera comes to the Hedjaz over India. England goes in for free trade in everything, opium and cholera included. She says, if you don't want the cholera that my ships bring to your ports, then keep your towns in a good sanitary condition and it will do you no harm. But why does she not keep India in a good sanitary condition and thus eradicate this fell disease?

Yours, sincerely,
I. A. S. GRANT BEY.

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*To the Editors of* THE CLIMATOLOGIST:

I have just received a letter from a medical friend in Colorado Springs asking me to write a few words for your Journal, giving my impressions of Camden, S. C., especially as to its fitness for such cases of lung disease as are unfavorably affected by the high altitude of the Rocky Mountain Region. That section, as is well known, is unsuited to cases of fibroid phthisis, where bronchial irritation is excessive, or where the heart's action is more or less embarrassed. The progress of the disease is apt to be very slow under favorable conditions, but the incessant cough and expectoration, as well as various forms of nervous disturbance which are often aggravated, if not actually induced by continued residence at a high elevation, may be sufficient to bring about a state of physical depression which will favor the development of more active pulmonary disease. Such cases are met with in Colorado, and are difficult to advise as to a change of residence, as the benefits to be derived are offset by a corresponding risk. This is especially true of cases where the pulmonary lesions are of more serious character, and where the tendency to fever is increased in a mountain climate.

When, however, the decision is reached that a change must be made, one naturally turns to the sand and pine regions of the South. A change to Southern California has, in many instances, proved disastrous to residents of Colorado, so that it is little advised by local physicians. Having left Colorado Springs but two months ago, spending some weeks at Asheville on the way, I can give but the impression of a very brief stay in Camden, supplemented by a few facts and figures at hand.

Camden is situated in what is known as the Upper Pine Belt of South Carolina, extending from southwest to northeast through the State, with an elevation of from 130 to 250 feet. It possesses the climate common to this region, with other features of its own. The soil is light and very sandy, except in the river-bottom west of the town, where the subsoil of clay is exposed. In other directions lies a wide extent of gently rolling country covered largely with forests of long-leafed pine. The soil does not retain moisture. Within a few hours after rain has fallen one can walk dry-shod anywhere. As a consequence the air is dry comparatively. It does not, at least, communicate the sensation of dampness and chill.

The yearly rainfall compares favorably with that of other Eastern resorts. In the twenty-five years ending December, 1890, the annual average was 41.68 inches. Greatest monthly precipitation, July 4.75 inches, August 4.71 inches, the least, October, 2.56 inches, November, 2.58 inches. From December to May inclusive, the monthly average has been 3.29 inches. Frost occurs not infrequently at night, but rarely by day. Snow is exceptional. I find no records of more than three rainy days in succession.

I select a few figures as representing a fair average of the records at present obtainable. I regret their incompleteness. From Feb. 19 to April 18, 1890, there were 9 days on which rain fell. Cloudy days not recorded. During February (the temperatures being taken at 9, 12, and 6) the coldest day shows a record of 41°, 50°, 50°; warmest 65°, 83°, 79°, both fair. During March, coldest day 32°, 40°, 39°, rainy; warmest, 70°, 81°, 75°, fair.

During April, coldest 48°, 50°, 52°, rainy; warmest 78°, 86°, 83°, fair. From April 12 to May 8, 1888, the coldest day recorded gives 51°, 62°, 55° at 9, 3, and 6; warmest 72°, 87°, 82°.

During the winter and spring of 1891, which was an exceptionally disagreeable season throughout the South, there were, from Feb. 14 to April 18, 44 fair days, 10 cloudy, 8 rainy, and 2 not described.

Fine weather decidedly preponderates, and, owing to the qualities of the air and soil, outdoor life is generally pleasant, except when it is actually raining; so that there are few days when an invalid need confine himself within doors. In dry weather there is no dust. Overcoats are not often necessary during the day, except when driving. The town numbers 3500 inhabitants, has good railroad, postal, express, and telegraph facilities, two banks, several churches, and stores where immediate necessities can be supplied. A distinctive feature of the place is the air of restfulness, which pervades everything and everybody. This finds its highest expression in the "Hobkirk Inn," F. W. Eldredge, proprietor, which is an old family mansion, enlarged and adapted to its present use, and which leaves nothing to be desired in providing for the comfort of its guests, as well as in its home-like atmosphere. Another excellent house, "Uphton Court," is also an old-time residence, such as abound in this neighborhood, and though often out of repair, are picturesque and full of historical suggestions. Camden has not as yet become populated with invalids. Advanced cases of phthisis are not encouraged to come here. The climate, although mild, has not the enervating qualities of lower latitudes, and the air of the piney woods has a certain therapeutic value. Advantages over such a mountain resort as Asheville consist in comparative freedom from inclement weather, from mud and dust, and in the more level country, which favors walking where the strength is somewhat reduced. There is abundant testimony as to the improvement experienced by those suffering from catarrhs, nervous disorders, incipient, and even advanced phthisis, though of course these latter are unfavorable cases anywhere. The water and drainage are good, and thoroughly good medical attendance can be secured.

Those who seek a life of gayety and excitement are likely to find Camden dull. The visitor will find that for him life centres at the Inn, but delightful society is to be found there and among resident families, while the country offers such amusements as riding, driving, tennis, shooting, etc., with excursions to many points of interest in the neighborhood.

In conclusion, it may be said, although advice as to residence must be influenced largely by individual considerations, the class of patients above alluded to will find the conditions here as favorable as are anywhere offered, and may reasonably expect relief from their more urgent symptoms, as well as such permanent improvement as is permitted by the amount of damage already suffered by the lungs and heart. J. C. P.

CAMDEN, S. C., December, 22, 1891.

# ABSTRACT FROM CURRENT LITERATURE.

In Charge of W. D. GREEN, M.D.

*The* Editors *request that Reports of Papers read before Societies, Reprints of Articles, Letters from Physicians containing matters of General Interest pertaining to the Subjects in the Title-page of this Journal should be sent to the* Editorial Office, 913 Walnut St., Phila., *marked for* Climatologist.

## BACTERIOLOGY.

**Preliminary Note on a New Chromogenic Micro-organism found in the Vesicles of Herpes Labialis. "Bacillus Viridans."** Wm. St. Clair Symmers, M.D., has discovered a new micro-organism in the lymph obtained from a labial herpetic vesicle of two days' duration, and occurring in a case of croupous pneumonia of five days' standing. It occurs in the form of either rods or threads, either as long solid filaments or as strepto-bacteria. The filaments were mostly solid, without septa, sometimes very long, with tapering ends, oftentimes twisted back upon themselves, and curving in various directions. Free spores did not occur as a rule, but by the use of poisonous substances spore-like bodies were caused to appear in cylinders. Dumb-bell and drum-stick forms were also found in great quantity.

Many nutrient media produced luxuriant growth, and in some a pea-green color was formed. This coloration spread through the medium while the microbe itself remained uncolored. Light produced no effect either upon its growth or its chromogenic properties. Growth occurred most rapidly at a temperature of 100° F., although the organism grows well at ordinary temperatures. It is in part ærobic, growing best in contact with air; but, although growth occurs in an atmosphere of pure hydrogen, the power of producing the peculiar pigment is absent unless access of oxygen be permitted. That this peculiar pigment is not purely an immediate product of the micro-organism is shown by the fact that when it was grown in an atmosphere of pure hydrogen the liquefied gelatine remained colorless, but took on the green color after the admission of oxygen—showing that the green pigment is not secreted as such, but that oxygen is necessary to complete the process. On some media, cocoanut, potato, etc., the green coloration was not produced, while the addition to the gelatine of some antiseptic, such as creasote, permitted the growth of the organism, but prevented the formation of pigment.

The pigment has not as yet been isolated. It changes color with age, becoming of the color of sienna, with the later addition of a crimson tint. It is decolorized by both mineral and organic acids, the green color returning upon neutraliza ion. That it is not pyocyanin is shown by its insolubility in chloroform.

After subcutaneous injection of the microbe in rabbits, patches of alopecia and ulcerations occurred, but the experiments were too few to warrant any deductions.—*Br. Med. Jour.*, December 12, 1891.

**Pyogenic Microbes of Lower Animals.**—Mr. S. Whitbick reported the following among other results obtained during his investigation of the microbes found in the pus occurring in lower animals. Staphylococcus pyogenes aureus was isolated in pus from a deep-seated abscess in the neck of a horse. Staphylococcus pyogenes citreus was obtained from a "fistula of a horse." The bacillus pyocyaneus was isolated from an open synovial bursa of a horse. In the liver of a horse, that had died of septic poisoning, the pyogenes foetidus was found. His conclusions are that the bacillus pyocyaneus was the most malignant germ of those isolated, while the staphylococcus pyogenes aureus was the most common form.—*The Vis Medicatrix*, December, 1891.

## CLIMATE.

**Southern Pines as a Health Resort.**—In the New England Medical Monthly, Dr. Wile, after stating his dissatisfaction with the now well-known health resorts, states that the following conditions should be fulfilled by any place that is recommended for the climatic treatment of pulmonary disorders: 1. It must be located on high ground. 2. The drainage must be perfect. 3. The temperature must be even. 4. The rainfall must be small and the water speedily absorbed by the ground, so that as little moisture as possible shall be held by the surface. 5. The air must be dry, and this cannot be the case unless the fourth condition be present. 6. The air must be pure as well as dry. 7. The place must be a quiet one, rest and quiet being important factors in the relief and cure of pulmonary diseases. 8. The surroundings of such a place must be of a character to preclude everything which will interfere with sleep, and, if possible, as in the pine woods, must be conducive to sleep. 9. The water must be pure and wholesome. 10. The hotels must be good and the food nourishing. 11. If we can have, combined with these, an atmosphere laden with the balsamic odor of pine trees, it will be as near the ideal resort for this class of patients as we can hope for. All of these conditions, it is claimed by the author, are fulfilled at Southern Pines, N. C. It is exempt from the extreme cold of the Northern States and from the torrid heat and malarial influences of the more Southern. It is also protected from the bleak winds of the northwest by the lofty Appalachian Mountains. The Gulf Stream, which passes by its eastern coast, produces a soft and genial climate "similar to that of southern Italy and France."

The following comparative temperature-averages are given in the author's aper:—

| | Middle Section. N. C. | Genoa, Italy. | Florence, Italy. | Bordeaux, France. |
|---|---|---|---|---|
| Mean annual | 58° | 61° | 59° | 57° |
| Summer | 77 | 75 | 75 | 71 |
| Winter | 44 | 47 | 44 | 43 |

The town of "The Southern Pines" is situated upon the summit of a sandy ridge, covered with long-leafed pines and known as Shaw's Ridge. This ridge rises, by a series of hills and valleys, to a considerable height above sea-level, is in about the centre of the State in latitude 32°12′ north, longitude 72° 21′ west, and is placed midway between the Pedee and Cape Fear Rivers. The town, therefore, is situated in the heart of the long-leaf pine belt, 600 feet above sea-level, and within a day's ride of New York.

The author gives the following as the meteorological conditions present: average annual mean temperature, 58°; average summer temperature, 77°; average winter temperature, 44°; average minimum, 13°. The average mean rainfall is 45 inches, this amount being attained by a nearly uniform distribution throughout the different seasons. Notwithstanding this large rainfall, the tables of humidity show that the climate is as dry as that of France, while the cultivation of the vine, cotton, silk, etc., furnishes further proof of the truth of these statements.

One of the greatest advantages of this resort is the ease with which it can be reached, thereby permitting of its being resorted to but for a short time if necessary, and allowing the active but weakly business man to seek shelter from anticipated and predicted cold waves without necessitating the large amount of preparation necessary in adjusting his affairs for a prolonged journey to points further removed from his ordinary place of business.

The author then quotes from G. H. Saddleson, M.D., as follows:—

"It having been known that I had resorted to this locality on account of pulmonary trouble, and had received marked benefit, I was requested to write my views concerning this region. The points presented regarding the elevated long-leaf pine section are based upon observations made by myself during a three years' residence here, and corroborated by other resident physicians, also by many persons of high standing who have lived in this locality since early childhood.

"Extending from southeastern Virginia along the Atlantic coast to the most southern part of Florida is the great long-leaf pine belt of America. From this species, botanically termed *Pinus Australis*, are manufactured the spirits of turpentine, resin, tar, and pitch of commerce. This variety is also known by the name of yellow and pitch pine, but these terms are inappropriate, as they are applied to other species."

The value of this variety of pine is well known as a curative measure in pulmonary affections, while the quantity of ozone present in the air is, according to the author, greater in regions wherein the long-leaf pine grows than in that timbered by the other varieties.

It is claimed that the ground moisture of this locality is very slight, but that the water-supply is abundant and pure in quality.

There is one noteworthy point mentioned by the writer in regard to the question of sleep. Upon first coming to the place the desire to sleep is almost irresistible. This would, therefore, recommend it as a good place to which to send cases of insomnia.

The cases most markedly benefited are those suffering from bronchitis, asthma, phthisis, nervous exhaustion, kidney and bladder troubles, insomnia, and allied disorders.

The author concludes his paper as follows: "I am satisfied that Southern Pines possesses more of the qualifications of a genuine health resort, especially for those who are afflicted with pulmonary diseases and all of those of the air-passages, than any other place with which I am acquainted or have read about."—*The Prescription.*

## FOOD AND DIETETICS.

**Hygiene and Dietetics of the Arthritic.**—In the December number of *The Physician and Surgeon*, Dr. Lucas Championnière, in the course of an able article upon this subject, deduces the following rules as to the best diet to be ordered for the patient. The author says that for those suffering from *pronounced* arthritis who are very *lithæmic* preference should be given to white meats, veal and young animals, mutton, and lastly beef. In some cases, however, game or venison should be denied. If fish be ordered, the white-meated is best, as we find it in the sole, haddock, or codfish, while such colored or oily flesh as in the salmon, eel, mackerel, or sturgeon had best be avoided. Shellfish and crustacea, while nutritious, the author considers as too compact in their tissues, and hence indigestible, and on this account inadvisable for the arthritic.

Peas and beans yield a considerable amount of nitrogenous matter, but, strange to say, do not seem to form uric acid. The fruit-acids become alkaline in the system, and these two classes the author advises in the diet table.

As to liquids Dr. Championnière considers water especially good for the gouty. Some writers have gone so far as to say that this article alone is sufficient for a cure. Water increases the excretion of urea, and it is proven that the production of uric acid is in indirect ratio to the formation of urea, hence the more water the patient consumes the less uric acid is formed. Finally, water aids in the elimination of all waste organic products, and in the dissolution of the fatty acids which constitute gall-stones. A dry diet, it is thus seen, is rather a dangerous one for the arthritic.

As to wines the author advises very light varieties. Alcoholic wines and champagne especially are most injurious.

The following rules are held to be applicable to every case:—

See that the arthritic patient produces and absorbs the least possible amount of organic poison which, by irritating the less resisting connective tissue, would cause arthritic manifestations.

Modify the arthritic diathesis as far as possible by means of exercise, gymnastics, hydrotherapy, massage, etc.

Attend to the amount and quality of the food; hasten nutritive changes; facilitate elimination of all organic waste and toxines by stimulation of the emunctories, which are usually unreliable in arthritic patients.

**Preservation of Meat for Ten Years.**—A gentleman in New York has just tested the result of preserving a turkey in a refrigerator for ten years. This time having elapsed the fowl was removed from the refrigerator a short time ago, and after being properly cooked was eaten by a party of well-known gentlemen. While putrefactive changes seem to have been entirely avoided, it was found that the meat was practically tasteless, and had lost all of its characteristic flavor.—*Scientific American*, December 19, 1891.

## LIFE INSURANCE.

**Albuminuria in Relation to Life Insurance.**—In a report of the November meeting of the Hunterian Society (*British Medical Journal*, December 12, 1891) Dr. Hingston Fox reported that from a large series of cases he had deduced the following results and conclusions as to the presence of albumin in the urine. He had examined 280 men and 2 women from the middle and upper classes of society who averaged 33 years of age. He found albumin present in 86 cases (30 per cent.). To detect this substance he considered that coagulation by heat was an accurate enough method as a rule.

Dr. Fox has grouped the cases under several heads.

1. Albuminuria of renal disease, 8 cases. Here he never hesitated, but promptly rejected the applicant for insurance.

2. Permanent albuminorrhœa, 1 case. In cases where this diagnosis was certain, a policy might be issued on special terms, provided the age was under 40.

3. Albuminuria of loaded urine, 22 cases. This was rather a common class, especially in those living in cities. This form usually promptly yielded to treatment, and, if so, the risk was not prejudiced.

4. Albuminuria due to unstable circulation, 20 cases. If this appeared in persons with loosely-built circulatory apparatus, irritable hearts and varying blood tension, and disappearance of the albumin occurred later in the day, then a trace was not considered as adding to the risk, and acceptance was determined by the circulatory conditions.

5. Toxic albuminuria, 8 cases, was simply touched on and nothing said as to acceptance.

6. Albuminuria of strain or shock, 3 cases.

7. Vesical, urethral, or vaginal albuminuria, 5 cases. Reasons were given for believing this class to be much larger than it is usually considered, as slight gleet or leucorrhœa would, of course, vitiate the tests.

8. Undetermined albuminuria, 17 cases.

In all accidental albuminuria, where the second specimen of urine gave a negative result upon analysis, the risk might be passed.

Dr. Pavy, in discussing Dr. Fox's report, believed there could be no albuminuria save as a result of renal disease; but renal disease—even Bright's disease—could exist without albumin or casts. He did not look, as many did, with such terror upon cases due to loaded urine. Ladies often drank but little, and would pass heavily loaded urine without harm. He believed in "functional albuminuria," and in his experience such a condition did not lead to structural disease. These cases of cyclic albuminuria were associated with the bodily position, the urine in the morning being free, while later in the day (early forenoon or even afternoon) albumin appeared and was gone by bedtime. Alteration of the mode of life would alter the amount of albumin secreted. Dr. Pavy said that for the purpose of analysis, he usually procured four samples of a patient's urine passed upon rising in the morning, at noon, at six P. M., and at bedtime. In cases applying for insurance, the examiner had to decide whether there was functional or structural disease, and this required a far more scrupulous examination than in the case of private patients, who would have no object in misleading the examiner.

Sir William Roberts said that he had some years ago used the expression "physiological albuminuria," and had been severely criticised for it. He agreed with Dr. Pavy upon "loaded urine," but still adhered to his opinion, that a trace of albumin might be physiological. The urine might vary in specific gravity from 1004 to 1040, and the flow be 80 times greater at one time than another, yet all within a physiological range. After sharp exercise, a heavy meal, cold, races, or baths, a trace of albumin could be detected, as he had found by a series of special observations. Were these things unphysiological conditions? He thought not. Then, too, the tests for albumin were not by any means transcendental, for if 3 drops of a highly albuminous urine were added to a pint of ordinary urine, then, while albumin was assuredly present, no ordinary test would detect it. As for albuminuria in relation to life insurance, it was helpful to differentiate its varieties as Dr. Fox had done, and when further division was made he hoped to see there "physiological albuminuria."

Dr. Maguire said, as regards the methods of detecting albumin, that "fancy tests" were liable to mislead examiners. The boiling test was a delicate one if properly applied, but not reliable. Sir William Roberts's solution of sulphate of magnesia in nitric acid, introduced many years ago, was delicate, rapid, and reliable. No applicant with albuminuria and obviously bad health would receive attention at any insurance office. The point was, therefore, what is the significance of albuminuria in comparatively healthy applicants? The question raised was, the prognosis of albuminuria in its very widest sense. These cases were gradually being differentiated, and being classed together in their proper categories, as had been done by Dr. Fox.

## MINERAL SPRINGS.

**A Remarkable Chalybeate Spring.**—An editorial in the *Lancet* (Nov. 28, 1891) draws attention to a chalybeate spring at Flitwick, in Bedfordshire, whose water is described as of a clear sherry color, acid in reaction, constantly of a temperature of 45° F., very pleasant to the taste, and containing the persalts of iron in large quantities, as much as 170.8 grains of persulphate of iron to the gallon being found upon analysis.

Upon heating this water a large quantity of the metal held in solution is precipitated in the form of ferric oxide (85 per cent.) combined with a small amount of sulphuric acid. This form of iron, it is said, is well adapted for rapid absorption and assimilation.

The water is found oozing through a layer of black peat, the surrounding soil being of peat containing a large percentage of oxide of iron. Underlying this peat is a stratum of marly clay containing oxide of iron (76 per cent.) with alumina and phosphoric acid. Below this is a layer of dark sand. It seems that no other British chalybeate spring contains iron in just the same form, a remarkable point being the seeming absence of carbonic acid, either free or in combination.

The attention directed to this spring has caused the writer to look at the resources of Europe in the matter of iron springs. The best known are Schwalbach in Germany, Spa in Belgium, Levico in the South Tyrol, Luxeuil in France, Tunbridge in England, St. Moritz in Switzerland, Ballynahinch in Ireland, and Orezza in Corsica. These springs, of course, vary greatly in their mineralization and temperature. St. Moritz, Spa, Luxeuil, and Tunbridge are feeble in minerals, while Levico, Schwalbach, and Orezza are very strong. In temperature they vary much. St. Moritz is 40° F.; Schwalbach, 48° to 50° F.; Levico, 46° to 50° F.; Luxeuil varies from 70° to 133° F.

Schwalbach water is very pleasant to drink, from the large amount of free carbonic acid present. It is a pure iron water, having but few other minerals in solution.

Spa is like the previous water, but contains much less iron and carbonic acid.

Tunbridge, upon analysis, is about of the same constitution as Spa.

Orezza, from its elevated position, is one of the strongest iron springs in Europe.

Luxeuil possesses iron in the form of the phosphate and carbonate, and while the amount of each of these is small the temperature being high makes the water quite easily digested and therefore very efficacious where iron is indicated. In addition, arsenic and manganese are present in small amounts, which gives the water its easy digestibility.

Levico water is described as arsenio-ferric, containing arsenious acid and sulphate of iron.

Most of these ferruginous springs contain, besides the iron, such ingredients as lime, soda, potash, arsenic, manganese, lithium, and silica.

The utility of an iron spring is not to be determined by the amount of iron present; but rather by its digestibility, temperature, and some of the special ingredients present.

Carbonic acid impregnation is greatly in a water's favor because it increases its palatability and diminishes the inky flavor. The therapeutic indications for the use of iron waters are anæmia, chlorosis, general debility, impaired convalescence after fevers or acute inflammations, some varieties of dyspepsia, hypochondria, and certain uterine conditions. Most of these springs add climatic and scenic attractions to the value of their mineral waters.

These waters are contra-indicated in inflammatory conditions, nervous irritability, epilepsy, and cardiac diseases.

## SANITARY SCIENCE.

**Carpets and Infection.**—Attention is called to this important matter, and all thinking people will at once recognize that in the carpets lurks the germ of many a disease. Frequently a carpet is made necessary on account of the flimsy character of the poorly joined floors, and the accumulations of dirt that fill the crevices, together with the warmth that the carpet affords, form an excellent breeding-place and medium for microörganisms. Then come the broom and dust-brush which disseminate those germs that were deposited with the dust, and the sunbeam shows us how beautifully the housemaid has aided nature in diffusing the ripe, warm, well-dried, and nourished bacteria.

One can shut his eyes and see the vision of the housemaid with a towel wrapped around her head, enveloped in a cloud of dust, energetically detaching the myriads of germs from their safe hiding-places; great-grandmothers gloried in their polished floors, and their children inaugurated the wet tea-leaf when the carpet came into general use.

The patent sweeper is a great gain from a hygienic point of view, and if people *will* tightly tack down their carpets on a bare floor they should at least sprinkle it when swept with a patent sweeper, abolish the broom, and once a week wipe up the whole floor with a cloth well saturated with a solution of carbolic acid, creolin, Platt's chloride, or some such material.

*Once a year every carpet in the house should go through the steam-cleaner*, and the floor should be scoured with boiling water and carbolic soap. An architect should at the present day be thoroughly posted as to the requirements of hygiene; he can be an apostle of health to the same extent as the physician.

Every house should have a well-laid floor with corners rounded, and this should be required by law. In the large cities the plumbing laws and their enforcement are saving lives, but there is no law to attack the lurking germ in the cracks and crevices of the "bonus building." Let such be made.—*Med. News*, December 12, 1891.

**Typhoid Fever and Oysters.**—At a late meeting of the British Medical Association Sir Charles Cameron read a paper entitled "Sewage in Oysters," wherein he stated that he had found that in oysters collected in Dublin there was present material from the sewers. The reader of the paper has recorded a series of cases of enteric fever apparently caused by eating oysters, and remarked that in nearly all of the cases of mussel-poisoning on record the shell-fish were in contact with sewerage. The possibility of such a method of infection can well be believed, and such a source of the poisoning might account for some of the cases of enteric fever whereof we can find no other possible source.—*Br. Med. Jour.*, November 28, 1891.

In this connection it is of interest to read the report which Sir Charles Cameron sends to the *Lancet*, November 28, 1891, of the then existing epidemic of typhoid fever in Dublin. This disease is the only one of the principal zymotic diseases which in Dublin shows no tendency to decrease. Typhoid fever has been very prevalent since early in August, and as it is the one trouble prevailing more than any other of the zymotic diseases at Dublin, it is not considered strange that, with the existing epidemic all over the United Kingdom, that city should have even more of the fever than usual. Sir Charles cannot think that the present epidemic is due to a bad system of sewers or sanitary accommodations, because these are neither better nor worse in autumn than at other seasons of the year.

As soon as a case of typhoid fever is reported to the health authorities an inspection of the premises is made and careful records kept. In 25 per cent.

of the cases defective sanitary arrangements were found. In the remaining 75 per cent. no such cause could be detected.

The disease seemed to prevail more among the middle and upper classes and to be equally present in both the city proper and also in suburban parts. The type, he thinks, milder than was the case in 1889, as, though there were more cases in 1891 than in the former year, the deaths are much fewer.

In concluding, Sir Charles states that the water supply of the city is carefully analyzed periodically, and as nothing was found wrong with it, he is satisfied that the cause must be elsewhere; though why this disease in the closing months of the year occasionally becomes epidemic over a large portion of the world he cannot determine.

**Isolation after Diphtheria.**—The length of time during which a person who has had an attack of diphtheria should be isolated is the subject of a communication from Dr. Morton Prince to the *Boston Medical and Surgical Journal*, December 24, 1891. The writer details the occurrence of a case of this disease in the child of a family whose guest was a man who had been "sitting up" for nine days before his arrival. He also relates in brief the occurrence of an outbreak of the disease among a family following shortly after the employment of a trained nurse who had just come from attendance upon a fatal case of diphtheria. He has adopted the rule of advising quarantine precautions for at least a week after the patient appears to be perfectly free from the disease.

**Leprosy and Vaccination.**—Tebb, in a small pamphlet, has attempted to show that the spread of leprosy may be traced in great measure to vaccination, and expresses his opinion as follows: "I think it is obvious that the most effective method of arresting the serious encroachment of leprosy, all the world over, is to discourage the practice of vaccination."—*Am. Jour. Med. Sc.*, January, 1892.

**The Disposal of Garbage and Refuse.**—At the nineteenth annual meeting of the American Public Health Association, held in Kansas City, October 20, 1891, Dr. Delos Fall discussed the subject of the disposal of refuse at some length. He spoke of the intimate relations existing between great filth accumulations and typhoid fever.

The methods employed in the larger cities of this country for disposing of garbage were detailed as follows:—

New York favors the method of having the refuse matter carried to sea some distance in large scows and there it is dumped. Philadelphia and San Francisco recommended cremation. Chicago protested against filling in low-lying lands and then building over the packed-in garbage. Cincinnati had a contract with a desiccating company which removed all its refuse. In Charleston the city dumped all such filth into a large salt-water marsh. In Milwaukee garbage was thrown into Lake Michigan, much to the disgust of the citizens.—*N. Y. Med. Rec.*, December 5, 1891.

# INDEX TO VOLUME I.